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THE CHINESE PERCEPTION

OF

CHEMICAL AND BIOLOGICAL

WARFARE

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1 August 1995

PREFACE

The relationship between the United States and the People's Republic of China has been a stormy association. As the summer of 1995 draws to a close, both nations have recalled their ambassadors for consultations on a variety of complex issues where national interests are at stake. While human rights, Taiwan reunification, China's admission to the World Trade Organization and alleged sales of Chinese missiles to Pakistan occupy center stage today, there are myriad other areas where our national interests conflict. One such issue is the threat of chemical and biological warfare.

Sun Zi, China's famous military philosopher, wrote "if you know the enemy and know yourself, in a hundred battles you will earn a hundred victories." It is this spirit that fostered *The Chinese Perception of Chemical and Biological Warfare.* This report, funded by the Institute for National Security Studies, is a first step toward a greater appreciation of China's view of these special forms of warfare. Incorporating China's open source articles and media accounts--in English and Chinese--this study is a unique resource defense analysts and arms control negotiators can use to assess China's view of potentially contentious issues related to chemical and biological warfare. It is also a useful reference novices interested in China can use to better comprehend how China employs its government bureaucracy and state-run media assets to formulate and publicize national policy.

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OVERVIEW. China's knowledge and experience with chemical and biological warfare is extensive. In its long history, there are many instances of Chinese military leaders resorting to rudimentary chemical or biological agents on the battlefield. China's historical perspective incorporates these experiences with Western accounts to form a greater picture of the history of chemical and biological warfare. While acknowledging that modern chemical warfare developed in Europe in World War I, China is also well aware that Japanese chemical and biological agent experimentation in China from 1937-1945 brutally victimized the Chinese people. Since 1979, China has also possibly used chemical agents in warfare with Vietnam and within its own borders to suppress dissension in Beijing, Tibet and Shenzhen.

1. Pre-Modern History:

Most Chinese reference works on chemical and biological warfare conform to the Western view. For example, there are no contentious discrepancies on the use of chemicals in Spartan attacks or by German forces in the modern era, beginning in April 1915.

The Chinese, however, acknowledge that chemical and biological warfare is part of its own military heritage. Detailed military references provide many examples, some of which are recorded in China's classic historical works. For instance, the Zuozhuan classic refers to an instance in the 5th Century B.C., when a member of the Qin Dynasty military poisoned the upper breeches of a river after an attack by opposing forces, "causing many deaths." In the 10th Century, a servant named Tang Fu presented the Song Dynasty court with a special mixture of poisonous ammunition he

developed; the Chinese account of this event is so detailed that it lists the ingredients and quantities of Tang's product.

The Chinese acknowledge that the chemical and biological warfare methods of ancient China were rudimentary and only marginally effective. It is for these reasons that China did not employ such measures on a widespread basis. However, the Chinese point out that the development of Western science and technology increased the role of chemical and biological agents as an effective combat resource.

2. Modern History:

Japanese Victimization: China's perception of modern chemical and biological warfare largely stems from the victimization of Chinese citizens by Japanese Imperial Army forces during the Japanese occupation of Manchuria in the 1930's and throughout World War II. At least four Japanese chemical and bacteriological units operated in China during that time.

The most famous, Unit 731, operated in Pingfan, outside the northern Chinese city of Harbin, conducting chemical and biological experiments on Chinese, Korean and Russian prisoners of war between 1939-1945. Unit 731 reportedly included a laboratory that infected hostages with contagious bacteria and viruses to obtain data for developing biological weapons. It is generally believed that more than 3,000 prisoners of war died as a result of such experimentation. Unit 731, known as the Pingfan complex, consisted of 76 buildings, including laboratories, dormitories for civilian workers, barns for test animals, greenhouses and a special prison for human test subjects. Encompassing six square kilometers, it employed 3,000 Japanese doctors, technicians and soldiers, rivaling Auschwitz in size. Japanese technicians reportedly infected Pingfan's prisoners with plague, typhus, smallpox, cholera and other deadly diseases. The victims reportedly died in "slow, feverish agony," with Japanese scientists observing them closely to measure the dosages needed to kill humans.

From 1938, a second group, known as Nami (Wave) 8604 Unit, conducted similar experiments at Guangzhou's Zhongshan University. Such experimentation included food and water contamination by typhus-causing bacteria (brought in from Imperial Army medical school in Tokyo) and the use of rats for experiments on plague. The Nami 8604 Unit, having a

covername of "The South China Quarantine and Water Supply Department," infected prisoners with malaria bacteria and typhus.

The activities of all four Japanese biological warfare units are confirmed through capture and translation of the units' headquarters and official documents as well as through evidence from former unit members and local residents.

Several important books chronicle Japan's biological warfare experimentation campaign against the Chinese. Sheldon H. Harris' Factories of Death: Japanese Biological Warfare 1932-45 and the American Cover-Up is the most comprehensive account to date. It expands on a newspaper series John Powell produced in 1981 documenting Japan's biological warfare experiments and describing American Government attempts after World War II to conceal knowledge of it. Powell's work exceeds that of British journalists Peter Williams and David Wallace, who in 1990 produced the first detailed work on such activities--Unit 731: Japan's Secret Biological Warfare in World War II. Japan, itself, has produced its own account of these atrocities with Seiichi Morimura's work, The Devil's Gluttony.

Harris' account of Japan's biological warfare campaign emphasizes the American effort to cover up the Japanese operations. Harris claims that in exchange for infonmatuin on the Japanese research, American authorities secretly granted immunity from prosecution to the organizers of the program, including its infamous leader, Lieutenant General Shiro Ishii. As Harris points out, no Japanese was prosecuted for these crimes in the Tokyo War Trials, likely because of the "intelligence gain" and because "no one in 1948 was prepared to raise the issue of ethics, morality or Judeo-Christian human values." Because many records were destroyed during and after the war, there is no reliable count of how many people died in the germ warfare operations. Harris estimates that the total is in the hundreds of thousands.

By all accounts, Japan's chemical warfare campaign against the Chinese was brutal and comprehensive. In the early 1990's, a Japanese scholar discovered a 28-page American government declassified document at the National Archives in Washington, D.C. that indicated Japan's Imperial Army produced 7.5 million poison gas shells from 1931 to 1945. This number, more than 5 million more than previously estimated, led investigators to suggest that many more chemical munitions may remain hidden in China.

The chemical shells, many made in Okunoshima Island, Hiroshima, were comprised of 6,600 tons of poison gases, including 4,400 tons of mustard gas and lewisite, both lethal blistering agents.

Japan has not denied the existence of germ warfare units or chemical munitions in China in World War II. However, they maintain that there is insufficient evidence to determine the extent of Japan's involvement with chemical and biological weapons. However, in 1993 Japanese scholars discovered documents at Japan's Library of the National Institute for Defense proving that the army engaged in secret germ warfare in China. To this end, Chinese leaders have asked Japan to help dispose of poison gas ordnance Japanese Imperial Army troops left behind at the end of the war, claiming that such shells had killed several hundred Chinese since the end of World War II. Hard-liners among the Chinese leadership have also pressed for war reparations, some calling for as much as $180 billion dollars. However, Japan "settled" its war reparation issue with China in September 1972, when diplomatic relations were reestablished between the two nations. The declaration was reaffirmed in 1978 in a friendship treaty that either side can annul with one year's notice.

In 1991, both governments pledged to dismantle the shells. Japan also sent officials to China to investigate whether Chinese were suffering from possible contamination of soil by decayed chemical weapons.

Chinese Claims: By 1994, the issue of unexploded chemical ordnance took on greater significance. The August 1994 edition of *Liberation Army Life* (Jiefangjun Shenghuo), edited by a publisher under the Chinese People's Liberation Army, strongly criticized Japan for not revealing information about the dumped poison gas shells. The article claimed "thousands" of Chinese had been injured or killed since the end of World War II by the ordnance the Japanese left behind throughout China. The article further claimed that the Japanese Army may have abandoned as many as two million poison gas shells on Chinese soil.

According to the article, between 1950 and 1992 discarded shells were discovered at 40 sites in nearly a dozen provinces and cities in a wide area of China, including Heilongjiang, Jilin and Liaoning Provinces. The gas shells reportedly injured at least 3,000 Chinese since the People's Republic of China was established in 1949. According to an investigation by Chinese Army

ordnance specialists, Jilin Province alone may have more than 1.8 million poison gas shells. Chinese authorities, working with Japanese specialists, estimate it would require six to eight years to dispose of the shells, whose total killing power reportedly equals that of the atomic bomb dropped on Hiroshima.

The article said Japan has so far not admitted that it used chemical weapons during World War II nor has it provided information about the dumping of poison gas. It called on readers never to forget the disaster brought by the Japanese army.

Propaganda Issue: The Chinese are quick to draw upon the Japanese Poison Gas issue for political gain. During periods of Sino-Japanese tension due to trade, investment or territorial issues, for example, China is quick to cite Japan's war crimes against China in World War II. Such references always portray China's citizens as innocent victims, praising their valor against the Imperial Army.

In a July 1987 commentary to mark the 50th Anniversary of the outbreak of war between Japan and China, the *People's Daily* said Japan had never fully acknowledged its war guilt. This report came at a time when relations were strained by Chinese allegations that militarism was re-emerging in Japan, as well as by Beijing's protests of Japan's trade surplus with China and complaints over a Japanese court decision awarding ownership of a student dormitory to Nationalist Taiwan.

The commentary noted that Japanese chemical weapons killed or injured 50,000 people in China between 1937 and 1945, the most widespread use of such weapons in history. Citing Chinese military sources, the article accused Japanese troops of using chemical agents to induce hemorrhaging, vomiting and suffocation on 1,600 occasions during the Sino-Japanese War. Compared with other wars around the world, China characterized Japan's use of chemical weapons as occurring for "the longest period, the most frequent, the most comprehensive and with the most effect on the widest area of land." The report concluded by saying that a very small minority of Japanese militarists continued to deny Japan used chemical weapons during the war.

Japanese Records: China's claims against the Japanese are corroborated by Japanese military records. Documents from the archives of the National

Defense Studies Institute (Japan Defense Agency) confirm the claims of the Chinese government at the Geneva Conference on Disarmament in February 1993 that chemical munitions remain on Chinese soil.

The Defense Agency records indicate that Japan's production of chemical weapons peaked in 1941, when as many as 600,000 shells with toxic agents were manufactured. It is believed that this number was produced annually until 1944, the scale of production attesting to the ability of the Japanese military command to conduct large-scale chemical warfare. Dated between 1932 and 1941, the Tokyo records detail the quantity and type of chemical arms produced by the former Japanese army. Its weapons included shells, bombs to be dropped from aircraft, and "smoke pots" with poison gases, such as mustard gas, then already banned under international law.

Admissions from Employees: On 15 August 1992, Japan's *Daily Yomiuri* reported that a former employee of a Japanese toxic gas factory in China would publish a book of photographs and documents from the plant which produced lewisite and mustard gases during the 1937-1945 Japan-China War.

Hatsuichi Murakami claimed he "was not a victim of war, but rather an accomplice who survived." Now a curator of the Toxic Gas Museum--established on Okunojima Island in Takehara, Hiroshima, in 1988--he is motivated by a desire to "teach younger generations about the brutality and tragedy of war through my experiences." Such tragedies included Japanese workers; since the factory was built, more than 1,800 former employees have died from illnesses reportedly related to the aftereffects of exposure to the gases. Many suffered from chronic bronchitis caused by exposure to hydrocyanic acid gas, as well as ulceration of the skin and water blisters caused by the lewisite and mustard agents. Others suffered from respiratory or gastrointestinal diseases; about 30 percent had various stages of cancer.

Murakami's book was the first such effort by someone directly involved with the Imperial Japanese Army's Okunojima chemical weapons plant, which was the largest facility of its kind from the beginning of the Showa era to the end of World War II. Toxic gases produced at the factory killed more than 80,000 Chinese during the war, according to the People's Liberation Army Chemical Defense Command Engineering Academy in China.

On 13 August 1985, a British television documentary was the first to document Japan's wartime crimes in China. The program "exposed the death camp set up by the Japanese Imperialists" in Shenyang, northeast China, where 3,000 Chinese, Korean, Russian, American and British prisoners of war were "horrifically killed" (Chinese sources do not corroborate that American prisoners of war were part of the experimentation).

By August 1992, China had publicized its own claim against the Japanese. Japan's Kyodo News Agency reported that China, through investigations of the People's Liberation Army Chemical Defense Command Engineering Academy, claimed the Japanese Imperial Army used mustard and other poisonous gases on 2,091 occasions in China during the 1937-1945 Sino-Japanese War, killing or injuring 80,000 troops and civilians (note: the Engineering Academy reportedly is composed of specialists on the use of chemical weapons; their report examined chemical warfare from World War I to the Iran-Iraq War).

Of the total, 423 gas attacks reportedly were against Chinese guerrilla-held enclaves in north China, which resulted in 33,000 casualties during the Japanese army's brutal "Sanko Operation," meaning "completely burn, kill and pillage." Against the regular Chinese armies, the Japanese conducted 1,668 attacks, killing 6,000 people and injuring 41,000.

Previously, the military and political sections of the Chinese Nationalist Government in 1946 made the only attempt to publish a comprehensive study on Japan's gas warfare in China, claiming that Japan used chemical weapons on 1,312 occasions with 36,968 casualties. In 1992, China characterized this report as unfinished and lacking details. It did however, confirm that Japan employed lethal mustard gas in guerrilla mop-up operations and in campaigns against Nanchang, Wuhan, Changde and other Chinese cities.

The report also mentioned there were some 671 types of gas used by the Japanese and of these 125 were considered lethal. The others were tear gas and stimulants. China characterized its citizens as "not prepared for the use of the gases"; consequently, Japan "achieved immense military results with just the small dose of [agents]."

The People's Liberation Army figures were obtained from what the Chinese described as a "thorough survey of documents in its archives,

including affidavits from Japanese prisoners of war, Japanese war records and papers from the Nationalist Chinese government." It reportedly appeared in the June 1991 edition of *History of Chemical Warfare* magazine, unavailable to the public.

The People's Liberation Army report reiterated that two million of Japan's wartime chemical weapons remain in China and are the focus of a debate on how to treat and dispose of the weapons. At the Disarmament Conference, China demanded Tokyo accept all responsibility for their disposal; China also requested an article be included in the chemical arms ban treaty that chemical munitions are the responsibility of the nations that abandon them.

Beijing first demanded in August 1990 that Japan dispose of the chemical shells, most of which are in Jilin, Heilongjiang and Liaoning Provinces, the three northeastern provinces that formed Manchuria, where Japan set up a puppet state after its 1931 invasion.

Throughout the deliberations on Japan's use of chemical and biological warfare, China continued to assert itslef on one claim, characterized by the following statement: "As direct victims, the Chinese military and civilians have the responsibility to disclose the criminal behavior brought about by Japanese imperialists." Over the foreseeable future, this will likely remain the impetus behind China's diplomatic initiatives toward Japan on this issue.

Vietnam's Charges Against China: The Chinese People's Liberation Army themselves may have used chemical weapons in combat with Vietnam. Shortly after the China-Vietnam border war of February 1979, Vietnam accused China of engaging Vietnam in chemical warfare. Noting that China had often accused Hanoi of using toxic chemicals, the Vietnam Government claimed China sprayed toxic agents in six northern Vietnamese provinces in "its war of aggression in February 1979." Before retreating, Chinese troops reportedly also poisoned wells and streams to kill Vietnamese civilians.

The Vietnam Government criticized China for its hypocrisy, noting that Vietnam has "struggled untiredly for a ban of the use of chemical weapons and the stockpiling of chemical weapons."

China's Charges Against Vietnam: During China's border conflict with Vietnam, the New China News Agency reported that Vietnam used of chemical munitions against Chinese forces. Released on 23 February 1979, the report noted that China's "punishment" of Vietnam, which began on 17 February, would continue and that Chinese units would continue to engage the Vietnamese regular army on Vietnamese territory. Characterizing China's operation as a "defensive counterattack," a military spokesperson said that China had captured a considerable number of Vietnamese soldiers, and that Vietnam had resorted to the use of chemical weapons in the fighting.

Some sources said the Chinese captured Vietnamese ammunition depots (inside Vietnam) which may have contained chemical agents. The Chinese organized militia groups of troops in the Guangxi Autonomous Region to help the People's Liberation Army "transport munitions and the wounded."

Later that year, on 15 August 1979, the *People's Daily* and the New China News Agency reported that Vietnamese troops were using "war gases" against the Meo tribes in Laos. The Chinese cited information published in the British *Daily Telegraph*, but, according to news analysts in the Soviet Union, "interpreted it in their own way, and built up their lies on this subject." A Soviet news items criticized the *People's Daily* for alleging that the Vietnamese troops were using Soviet-made toxic gases.

The Soviet report continued by criticizing the Chinese leadership: "Speaking of chemical weapons, it would be appropriate for the authors of the Chinese story and those who echo it in the British press to recall that it was precisely the [Beijing] leadership who a short time ago used chemical weapons in the course of their aggression against the [Vietnam]. The Soviet media also added that China's "fresh anti-Soviet slanderous venture about the use of Soviet-made gases by the Vietnamese for the destruction of the Meo tribe in northern Laos" occurred as China itself prepared for military ventures into Laos.

On 25 March 1981, the *People's Daily* accused Vietnamese forces of using chemical warfare to kill civilians and pro-Peking Khmer Rouge guerrillas in western Cambodia because Vietnam was "bogged down in a war they could not win."

The commentary claimed Vietnamese authorities were continuing to direct their forces in Cambodia to release toxic chemicals and drop poison gas bombs on Cambodian villages. Specifically, the article claimed that Thai military personnel in the border region "confirmed" that Vietnamese troops in western Kampuchea (Cambodia) had been using cyanide-based toxic chemicals to kill civilians and soldiers of democratic Kampuchea.

The article claimed Vietnamese forces had become frustrated with their lack of progress in Kampuchea, and were "trying to extricate themselves from defeat by resorting to chemical weapons."

China's Charges Against the Soviet Union: On 6 November 1986, the *People's Daily* reported that Soviet tactical troop withdrawals from Afghanistan were part of a cover-up for a military offensive in which Soviet chemical weapons killed 47 people. The article appeared three days after a Chinese Foreign Ministry spokesperson described the withdrawal of 8,000 Soviet troops between 15-31 October as "void of practical significance."

The article claimed that in an early September offensive, "a fairly large Soviet-Afghan military unit" discharged poison gas while attacking the Pagman Valley, killing 47 civilians,and rebels. The newspaper did not cite the source of its reports.

China's Charges Against the Soviet Union and Vietnam: In the early 1980's its became customary for China to criticize Vietnam and the Soviet Union collectively for their use of chemical agents in Afghanistan and Southeast Asia.

On 27 March 1980, a New China News Agency report noted that the mass media around the world had reported that Vietnamese troops had used chemical munitions obtained from the Soviet Union in combat operations in Laos and Kampuchea. The report noted that Tass commentaries had repeatedly denied the fact and alleged that it was a rumor spread by the China's state-run media. The report also noted that Tass denounced the sources of the reports as "doubtable" and criticized the information as fabricated by refugees from Laos and Kampuchea.

The New China News Agency article pointed out that Tass did not mention the non-Chinese reports that corroborated the use of chemical

munitions. The article noted an Armed Forces Press article on 25 March that reported that Thai military authorities, in a caution warning to border troops and residents, cited facts to show that Vietnamese-led forces used toxic gas against Kampuchean guerrillas in the border area. Also, according to a Bangkok dispatch in the Japanese *Asahi Shimbun*, doctors of the International Red Cross completed an autopsy of six Democratic Kampuchean soldiers in mid-February and concluded they were killed by poisonous gas. The doctors sent samples of their blood and tree leaves in the affected region to the headquarters of the International Red Cross in Geneva.

The Chinese media claimed evidence of the Red Cross investigation was irrefutable testimony to Chinese accusations that the Soviet Union and Vietnam had engaged in chemical warfare.

The article also noted an "epidemic disease" that killed a great number of people near Sverdlovsk (Siberia) in 1979. China claimed that an explosion at a secret biological weapons installation spread the germs that caused the epidemic.

The report concluded that China's accusations of chemical warfare were "by no means groundless": "Soviet troops are using toxic gases in Afghanistan and Vietnamese forces are using Soviet-made chemical weapons in Indochina."

A few months later, on 12 August 1980, the *People's Daily* reported that the Soviet use of chemical weapons in Afghanistan and the Vietnamese use of Soviet-provided chemical weapons in Laos and Kampuchea had "aroused strong indignation among world public opinion." The article reported that international representatives at the recently-concluded Disarmament Conference in Geneva appealed for a fair investigation of the charges. It added that the Soviet Union had used poison gas to massacre innocent Afghan people and the Vietnamese authorities had used Soviet-provided chemical weapons to slaughter the Kampuchean and Lao peoples. The Chinese described these measures as "atrocities which run counter to international law and humanitarianism."

The *People's Daily* account claimed that Moscow tried to deny its involvement by alleging that it neither manufactured nor possessed chemical weapons. However, the article also noted that Afghan patriotic forces had

not only acquired evidence to prove Vietnam used chemical weapons, but also that the Soviet Union supplied the chemical munitions it used in Kampuchea and Laos.

The article concluded by saying that the international community should "take every effective measure" to force Soviet authorities to abide by the Geneva protocol prohibiting the use of chemical weapons in war and compel the Soviet Union and Vietnam to stop using chemical weapons in Afghanistan, Laos and Kampuchea.

The next day, 13 August 1980, the Telegraph Agency of the Soviet Union criticized the *People's Daily* article for circulating "base and slanderous allegations" that the Soviet Union and Vietnam had resorted to chemical warfare.

The Soviet report noted that the Soviet Union had been a constructive part of deliberations to ban chemical weapons, both on a bilateral basis with the United States to issue a joint report to the Disarmament Committee and in the committee itself.

The Soviet report criticized China for "literal repeats of slanderous statements by Washington officials," evidence that China had "joined with Washington's sing-song, seizing upon any anti-Soviet campaign."

3. Contemporary Issues:

Use of Riot Control Agents in China: China has likely used riot control agents on Chinese citizens on several occasions. Both the People's Liberation Army and the People's Armed Police likely have carried out these measures; specific examples can be found in China's management of internal unrest in Beijing's Tiananmen Square, Tibet and Shenzhen.

The Chinese People's Liberation Army likely used riot control agents in 1989 to suppress the Tiananmen pro-democracy uprisings. *The Associated Press, Chicago Tribune, Washington Post, New York Times* and *International News* each reported tear gas use in Tiananmen Square beginning on 3 June 1989; however, China's media has never openly acknowledged that the military resorted to such measures.

Partial corroboration occurred in July 1989, when Premier Li Peng reportedly claimed that the People's Liberation Army units had to fire upon the pro-democracy demonstrators because "they did not have enough tear gas and had no rubber bullets." On 2 July 1989, the Reuters News Agency reported that Daniel Wong, a former mayor of Cerritos, California, claimed Li insisted that the soldiers "did not want any bloodshed, they wanted peace, they knew the students' intentions were good." However, Wong suggested that China's security forces faced a deteriorating situation--civilians seizing weapons and attacking soldiers--that forced them to act against the "bad people mixed up with the good."

Li, whom many Chinese bitterly criticized for "ordering the crackdown," reportedly admitted to Wong that the government was not prepared to deal with the uprising. Wong quoted Li as saying that when the security forces used their small supply of tear gas, they discovered it was ineffective. Li added that the army had no rubber bullets and that the fire hydrants around Tiananmen Square lacked sufficient pressure for water cannons. "Our police force is not trained for riots like in some other countries," Wong quoted Li as saying, citing South Korea and the United States as examples. The Chinese authorities admitted to only 200 civilian deaths, including 36 students, in the suppression by troops with tanks, together with dozens of soldiers and police. Foreign estimates of civilian deaths, based on witness accounts and diplomatic reports, vary from many hundreds to several thousand.

Units of the Chinese People's Armed Police also have likely used irritant agents against Chinese citizens. On 12 August 1992, the *China Daily* reported that the People's Armed Police "used tear gas and high-pressure water" to disperse a crowd of "thousands" of rioters in Shenzhen in the wake of unrest over stock market-related investments.

People's Armed Police operations in Tibet also reportedly involved the use of riot control agents. On 25 May 1993, the *Washington Post* noted that foreign business executives and travelers to Tibet reported that Chinese police used tear gas on Tibetan protesters in Lhasa to control the most serious turmoil there since 1989.

China claims it has had sovereignty over the region since the 13th century. Since the Dalai Lama, Tibet's spiritual leader, was forced into exile

when China crushed an uprising in 1959, Buddhist monks and nuns have led numerous separatist protests. The May 1993 demonstration came a day after China celebrated the 42nd anniversary of its having taken control over Tibet. When protesters gathered again today near the Jokhang Temple, Tibet's holiest shrine, police reportedly dispersed them with tear gas canisters fired from rooftops.

The People's Armed Police likely have greater access to chemical irritants than do members of the People's Liberation Army, primarily because of their greater likelihood of needing to resort to such agents. Another reason the People's Liberation Army may not possess a significant amount of anti-riot munitions is that the Chinese government lacks faith in its reliability. As the Chinese Communist Party struggles to redefine the role of socialism in the wake of the collapse of the Soviet Union and its eastern bloc allies, it has assuredly taken measures to prevent common citizens from having access to sensitive weapons and information.

A gunfight in the streets of Beijing in September 1994 attests to the lack of security among China's armed services. The Agence France Presse reported that on 21 September 1994, a "shoot-out" in eastern Beijing killed at least nine people and injured 30, creating questions about the reliability of the People's Liberation Army and the efficiency of China's police apparatus.

A "disgruntled army officer" who apparently killed his senior officer in a dispute before "going on the rampage with an assault rifle," was shot dead by police near the Beijing area of Jianguomenwai. Witnesses who saw the massacre said the man, armed with an AK-47, walked calmly along the Beijing ring road, covering a distance of at least 300 meters, opening fire at traffic and passersby, reloading as each clip of ammunition ran out. The rampage reportedly lasted more than an hour before police reinforcements arrived--helmeted and in bullet-proof vests--and shot the killer.

In the wake of the incident, many people criticized China's People's Armed Police for mismanaging the incident. The People's Armed Police, the internal enforcement arm of the Ministry of Public Security, had been criticized for its inability to quell the Tiananmen Square uprising in 1989. It eventually relinquished the Tiananmen operation to the People's Liberation Army.

Since 1989, China reportedly doubled the manpower of the People's Armed Police, increasing it to a force of a million men. It reportedly also acquired the equipment needed to become a legitimate urban security force--water cannon, stun guns, tear gas and troop carriers--in addition to training in crowd dispersal methods used in South Korea, Japan and Europe.

On 28 May 1994--just a few months before the "Beijing shoot-out"--Hong Kong's *South China Morning Post* reported from Beijing that China had developed the People's Armed Police--"a paramilitary force built up over the past five years"--to act as an intermediate force between regular police, which is not equipped to control large crowds, and the People's Liberation Army. The article noted that the People's Armed Police number about a third of the manpower of the People's Liberation Army; in Beijing itself, the People's Army Police commands about three divisions, numbering between an estimated 30,000 to 50,000.

Concerning armament, the article noted that in the past few years the People's Armed Police had "been on a world shopping spree," being particularly prominent as a buyer at police exhibitions in Europe. It reportedly has obtained riot control gear from South Korea, which it used during the 1990 Beijing Asian Games. In addition, it has electric batons, riot shields, combat radios, tear gas, armored personnel carriers and some helicopters.

In addition to equipment, the People's Armed Police has also developed its contacts with Interpol and has received additional information about riot control the police of other countries.

As a sign of its growing clout, the article noted that the People's Armed Police is now represented in the Central Military Commission meetings. In peacetime, the Ministry of Public Security commands the People's Army Police; in war, the People's Liberation Army assumes control. A large proportion of the top leadership of People's Armed Police reported is comprised of former military officers.

Comments on the Japanese Aum Shinri Kyo Cult: The Chinese government bureaucracy and media apparatus has been unusually silent on Japan's Aum Shinri Kyo cult. The cult--responsible for the death and injury of 12 and 5,500 people, respectively, in a Tokyo subway Sarin attack on 20 March

1995--provides China an excellent propaganda topic to further criticize Japan for its historical involvement in chemical and biological warfare.

However, neither the *People's Daily* nor the New China News Agency have provided commentary on the Japanese cult or its leader, Shoka Asahara. Aside from the normal reporting of detailed news releases by the Japanese media, the state-run Chinese media have made no judgments on the cult, its attacks or subsequent Japanese Government investigations.

THE CHINESE PERCEPTION OF CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 2:

PERCEPTION OF ISSUES

OVERVIEW. China has engaged in a variety of chemical and biological warfare issues over the past several years. Generally, these issues can be grouped into four major categories: the "Yinhe Incident" of 1993; safety and internal security; civil defense training; and military training (please refer to a bibliography of articles on these issues located on page 38).

1. The Yinhe Incident:

In August 1993, the United States accused China of dispatching a freighter carrying chemical weapon components to the Middle East. The United States claimed the Yinhe, meaning "Milky Way," was carrying to Iran at least 24 containers of thiodiglycol and thionyl chloride, chemicals which could be used to make mustard gas and nerve toxins.

The Chinese diplomatic and media apparatus denied the ship was carrying such components and criticized the United States for allegations based on inaccurate information. The *People's Daily* admonished the United States for "groundless and deliberate slander" and "ulterior motives designed to undercut China's good international credibility and undermine its friendly relations with other countries."

Specifically, the Chinese cited three "gross inaccuracies" in the American allegations:

First, the United States claimed the Yinhe set off from the city-port of Dalian in Liaoning Province on July 15; China reaffirmed it actually set sail from Tianjin on July 7.

Second, the United States claimed the Yinhe was destined for Bandar Abbas, a southern port in Iran, to unload the chemical components; China claimed that was not possible, because the Yinhe was a regular container freighter and Bandar Abbas had no container terminals.

Third, an inspection of all the 782 containers on the Yinhe by American, Saudi and Chinese officials at the Saudi port of Damman failed to discover the chemicals the United States claimed were aboard.

The Chinese demanded compensation for the false allegations and the loss of revenue caused by the refusal of nations to allow the Yinhe access to its ports. According to Sha Zukang, the chief Chinese representative of the inspection team in the Gulf, the shipowner, China Ocean Shipping Company, lost more than $12.9 million because the Yinhe was "forced to drift on the high seas for 24 days."

China cited the High Seas Convention--signed by 50 countries, including China and the United States, in Geneva in 1958--which stated that no warship could conduct searches of any vessels on the high seas unless those vessels were engaged in pirating or smuggling activities, or if the United Nations empowered such searches. They blamed the United States for orchestrating an effort to hold the Yinhe hostage at sea by restricting its port entry rights.

The Chinese claimed it had adhered to the terms and spirit of the Chemical Weapons Convention and that the United States had no right to "act as a world cop" by investigating another country's chemical control regime and policies, let alone to "demand verification and inspection." They also criticized the United States for encroaching upon the sovereignty of another country."

Chronology: According to the Chinese media, the following activities summarize the Yinhe incident:

July 7: The Yinhe, a 172-meter-long, 12,000-ton Chinese freighter owned by China's official China Ocean Shipping Group Company, left the northern port of Tianjin with 24 containers and a 30-man crew for Shanghai.

July 12: The Yinhe left Shanghai and proceeded to Hong Kong to pick up another six containers.

July 20: The Yinhe called at the Port of Singapore Authority before leaving the same day for Jakarta, Dubai (United Arab Emirates), Dammam (Saudi Arabia) and Kuwait.

July 23: The United States claimed it had evidence "strongly suggesting" the Chinese vessel was shipping 24 containers of thiodiglycol and thionyl chloride to Iran. The Chemical Weapons Convention had banned these chemicals as components of mustard gas and nerve toxins.

August 1: American naval warships and aircraft began tailing and photographing the Yinhe as it entered the Persian Gulf.

August 3: The United States requested China order the Yinhe back to its point of departure so American personnel could search the ship for chemicals.

August 3: The United States warned countries in the Gulf about the "discovery of dangerous chemicals on board the Yinhe." Subsequently, at least three Gulf states refused to allow the vessel to dock because of fear of agitating either Iran or the United States (the Yinhe was stranded in the Persian Gulf for 24 days; it later rode at anchor off the coast of the United Arab Emirates).

August 14: China conducted its own investigation and reported that the Yinhe's cargo of 782 containers included 24 containers loaded with stationery, metals, machine parts and dyestuff to be unloaded in Dubai and reshipped to Iran.

August 25: The United States imposed a two-year ban on exports of sensitive technology to China, affecting nearly $500 million in sales of electronics, aircraft, space systems and other equipment that could have military applications.

August 26: Chinese and Saudi officials began a joint check of the Yinhe at Dammam; American personnel participated as

technical advisers.

September 4: Inspections of the Yinhe ended after 10 days. China announced the discovery of nothing on board to support the charges by the United States that the Yinhe was carrying chemicals. China demanded a public apology and financial compensation on the grounds that it lost $12.9 million in the incident. It also demanded the United States pledge to abide by laws of international relations to ensure that similar misunderstandings would not reoccur.

Impact on Sino-American Relations: Beginning in early September 1993, China's state-run media began to lash out at the American conduct on the Yinhe. The 6 September edition of the *People's Daily* stated "what the United States did in the Yinhe incident seriously violated international law and its government must be held fully responsible for all the consequences thus incurred." On 7 September, the *People's Daily* denounced the United States and demanded a formal apology and pledge to prevent a recurrence of similar incidents. The article, *"U.S. Conduct on the Yinhe Incident: A Severe Breach of International Law,"* began by criticizing the United States for basing its charges on "so-called intelligence" and making groundless accusations against the Yinhe.

The article cited the United Nations' preliminary international legal mechanism on the control of chemical weapons and related chemicals. It described the Chemical Weapons Convention as "a mechanism for the prohibition of development, production, stockpiling and use of chemical weapons and on their destruction"; it described the convention as "having won universal attention because it reflects the position, aspiration and trend of the international community regarding the prohibition of chemical weapons and because it provides guidance for the handling of the question of chemical weapons by various countries." By these claims, China perceived the unilateral actions of the United States has illegal and in violation of United Nations initiatives on chemical nonproliferation agreements.

The article noted that China had all along strictly abided by the international convention and "earnestly fulfilled its international obligations." Despite the fact that the convention had yet to take effect, China, as a signatory, reportedly "maintained a stance and practice consistent with the convention's requirements" on chemical weapons. The article pointed out that the convention was not yet effective

and its verification mechanism had yet to be established. Finally, the article criticized the United States for not ratifying the convention.

The Yinhe incident occurred about a month after the United States accused China of violating the Missile Technology Control Regime by selling missiles or missile components to Pakistan. Although China denied such accusations, many analysts claim China continued such sales through loopholes in the internationally recognized agreement.

The United States could not ignore China's traditional role in the Middle East as an arms exporter, particularly with Iran and Iraq. During the Iran-Iraq War (1980-88), both sides reportedly loaded artillery shells with chemicals obtained from abroad, a particularly effective munition against unprotected enemy foot soldiers. Iran has close military ties with China, which supplied it with "Silkworm" anti-ship missiles fired frequently during the Iran-Iraq war. United States officials also claim China sold Iran equipment capable of enriching uranium used in nuclear weapons; China agreed in July 1993 to help Iran build a 300-megawatt nuclear power plant which both countries claim will only serve peaceful purposes.

2. Safety and Internal Security:

Much of China's concern over chemical and biological warfare stems from its inability to defend itself against widespread threats. With a limited amount of defensive equipment and a lack of effective emergency management procedures, the Chinese leadership is unable to meet the demands of widespread protection even against chemical threats; such liabilities are clear based on how poorly China's Public Security Bureau has managed non-military emergencies involving toxic chemicals.

Shenzhen Emergency: The most revealing emergency took place in the light-industrial city of Shenzhen in August 1993 when a series of at least nine explosions occurred at a dangerous goods warehouse run by the Chinese People's Liberation Army. As local Public Security Bureau officials worked to extinguish the inferno in the special economic zone, they also struggled with the inability of Chinese emergency services to control the disaster. Consequently, fires raged out of control for almost 15 hours, after chemicals stored in a dangerous goods warehouse exploded, triggering a series of other fires and blasts. Media accounts indicate that

as many as 80 people died in the explosions; more than 530 others were hospitalized.

During the emergency, Shenzhen officials admitted that firemen and rescuers were crippled by the lack of modern equipment in fighting the fire; they finally had to use powdered concrete to douse the flames. Lan Yuechun, a deputy director of the Shenzhen City Foreign Affairs Office, said there was not enough foam (used to put out fires brought about by chemicals) stored in the city to combat the blaze. Consequently, Shenzhen security units were forced to request assistance from nearby Guangzhou, but such relief did not arrive until most of the damage was complete. According to Hong Kong's *Wen Wei Po* daily, China had "more than 3,000 firemen, security officers and People's Liberation Army rescuers helping in the 20-hour operation." Although they were all "professionally trained to deal with big incidents," they were unable to deal with the chemical component of the disaster. A China Public Security Bureau spokesman later said about 200 fire engines were deployed, but that water was insufficient and ineffective in extinguishing the blaze.

The nature of the disaster quickly forced Public Security Bureau representatives to turn to the People's Liberation Army. About 100 People's Liberation Army soldiers--including officers from Guangzhou, Zhuhai and Panyu Counties--reportedly joined the emergency operations. Many presumably were members of the People's Liberation Army's elite Anti-chemical Corps, which helped investigate the cause of the incident. Expert teams, composed of members of the State Environmental Protection Bureau, the Guangdong Provincial Environmental Protection Bureau and the Anti-chemical Warfare Research Unit of the People's Liberation Army, jointly carried out environmental protection operations, such as monitoring atmospheric, soil and water quality throughout the area. More than 4,000 public security officers joined armed police, anti-riot brigades and People's Liberation Army members to help extinguish the fire. Additionally, the Guangzhou Military Region transported 10 tons of extinguisher powder to the Shenzhen Airport, which was instrumental in extinguishing the blaze.

In addition to the military, China called upon several other official organizations to augment the rescue operation. More than 100 medical personnel from regional hospitals supported the rescue, while other injured were sent to an unnamed police hospital. Also, the government placed the regional Nanfang Airline Company on full alert to help rescue the injured, and deployed firefighting

equipment from the provincial cities of Zhuhai, Foshan, Dongguan, Huizhou and Panyu.

China was forced to do more than rely on its national military and government assets to manage the Shenzhen emergency. The New China News Agency in Hong Kong (China's de facto embassy in Hong Kong) requested Hong Kong's assistance in fighting the blaze. The British colony offered to open its hospitals to Shenzhen casualties, flew three top officials to the fire scene by helicopter, placed the fire department on standby and activated a special emergency control center. Officials in Hong Kong also sent an unknown number of firefighters after an official request from Shenzhen. Hong Kong's director of fire services also surveyed Shenzhen by helicopter to assess the damage and see how Hong Kong, which also offered medical assistance, could help. Hong Kong also placed all relevant emergency departments on standby, including its Hospital Authority in case Shenzhen, some 30 miles north of the colony, ran short of hospital beds. Helicopters of the Hong Kong Government Flying Service were also prepared for an early morning (the next day) water-bombing mission but were not required.

Following the incident, security officials in Beijing--including a Vice-Minister of Public Security--led an inquiry into the devastating series of explosions in Shenzhen and assessed the ability of the Guangdong and Shenzhen authorities to manage the disaster. Part of this concern was because many residents and workers in the vicinity said they were unaware of any contingency plan to evacuate people despite the knowledge that many dangerous goods were stored nearby.

The eight warehouses destroyed in the blaze reportedly had been used to store a collection of potentially dangerous chemicals, including methyl benzene, hydrogen dioxide and zinc. A China News Service report said one of the two warehouses which did not explode contained 20 tons of hydrogen dioxide; the other had 1,000 tons of liquid propane gas.

Following the investigation, China's semi-official Hong Kong China News Agency said a huge nitric acid leak in a warehouse run by the People's Liberation Army caused the first explosion; fire subsequently destroyed a timber yard, a natural gas reservoir and eight of the ten factories nearby. The eight warehouses in the zone reportedly exploded in succession within four hours.

The second blast, at the natural gas reservoir, occurred about an hour after the first; it was so powerful it registered on earthquake seismographs in Hong Kong.

The New China News Agency reported that a large number of the casualties were policemen, firefighters and ambulance workers, who were insufficiently equipped to deal with the inferno. Among the dead were Shenzhen Public Security Bureau directors Wang Zhuming and Yang Shuitong, both in charge of firefighting operations after the first explosion and killed by the second. Although China did not release the final casualty figures, one hospital doctor said at least 70 died, but added that it was impossible to provide a precise number because casualties had been sent to hospitals across the region.

The Shenzhen blast was just one of several fatal explosions in 1993 in China, notorious for its lax industrial standards. In June, eight people were killed when an oil-laden freight train exploded while passing through a tunnel near Yenan in western Shaanxi province; in July, 29 died and 32 were injured in a chemical factory explosion in Zhengzhou, in the central province of Henan. Such catastrophes are a constant reminder of China's inability to efficiently manage large-scale emergencies, particularly those involving toxic materials.

Shanghai Emergency Telecommunications System: In addition to the Shenzhen incident, there are other examples of China's concern for safety and internal security related to chemical and biological threats. On 6 July 1994, the Chinese media announced that Shanghai would install a new emergency telecommunications system to allow authorities greater control in dealing with natural and industrial disasters.

Press reports said that the 800-megahertz wireless telephone and paging system would be located in the government's Shanghai Emergency Communications Office atop the new 20-story town hall that was currently under construction. The system was to go into operation in March 1995 (no further information is available to corroborate its existence). Equipment for the emergency system, established in 1992 at the suggestion of the State Council, was purchased from Motorola, which has a substantial manufacturing presence in Shanghai; the article also noted that the 800-megahertz frequency has traditionally been used by the Chinese People's Liberation Army.

The Chinese media reported that the Shanghai city government would solely control the emergency system, which includes several vans installed with satellite

receiving facilities and a microwave telecommunications system. Local government officials reportedly had expressed doubt that Shanghai's archaic telephone system could manage a widespread crisis, citing a 1983 earthquake in the Yellow Sea as an example of panic-stricken residents saturating the system with telephone calls, rendering the emergency network virtually useless.

According to the press reports, the municipal authorities were also worried about large-scale industrial accidents, especially in the chemical industry. Shanghai, China's largest industrial center, has nearly 16,000 factories that use toxic and hazardous chemicals, many of which are transported across the city's Huangpu River. As part of its ongoing efforts to develop a city-wide emergency response plan, the government in June 1994 held its first ever disaster drill, simulating a large chemical spill and clean-up operation on the Nanpu Bridge spanning the Huangpu.

3. Civil Defense Training:

China's concern for safety and internal security related to chemical and biological threats has resulted in a national emphasis on civil and quasi-military defense training.

Middle School Training: On 21 August 1987, the New China News Agency reported that middle schools in 17 cities where civil defense has been made one of the major tasks would begin offering courses on nuclear, chemical and biological warfare. In September 1986, China's Education and Civil Defense commissions instructed middle schools in the "major civil air defense cities" to offer civil defense courses. The Anti-chemical Corps of the People's Liberation Army General Staff Headquarters arranged for colleges and schools to compile instructional materials and tools; these items were then field tested in some schools in those cities. The tests indicated that the courses gave students a better understanding of national defense and enhanced their ability to prepare for nuclear, chemical and biological war.

The Yantai Number Three Middle School: The 7 January 1991 edition of *The Independent* daily reported that 14-year-old students in Shandong Province study lessons where Cold War and military matters predominate. Much of this emphasis reportedly is to maintain the "class war." The author of the article visited the Yantai Number 3 Middle School (along the China coast facing the East China Sea), where the day's lessons included "student recognition of chemical weapons and the

blisters, boils and blindness they cause." The article noted that following a review of differences between conventional arms and chemical weapons, the instructor posed more difficult, functional questions: how do you recognize mustard gas? (it smells like garlic); what about hydrocyanic acid? (it has a bitter taste like almonds); describe the first effects of nerve gas? (dilated pupils, blurred vision, heavy sweating and muscle spasms).

The article reported that Yantai's students are familiar with the "chilling tales of war." They have learned where to seek shelter during a nuclear holocaust and how to decontaminate clothing infected with nerve gas.

Qusai-Military Civil Relief Operations: In addition to civil defense training, China also trains for quasi-military civil relief operations. The *China Daily* reported on 22 July 1986 that China was "strengthening its defenses against a possible future nuclear or chemical attack"

The article--based on an interview with General Jiang Zhizeng, chief of China's People's Liberation Army Chemical Defense Department (Jiang is also responsible for nuclear defense)--stated that the People's Liberation Army was "building up its nuclear and chemical defenses to create more reliable wartime defenses and a more efficient peacetime rescue service."

Jiang reiterated that the Chinese government had repeatedly declared that China will not be the first to use nuclear weapons under any circumstances and will never use such weapons against non-nuclear countries. Jiang also stated that the huge stockpiles of nuclear weapons held by the United States and the Soviet Union and their development of chemical weapons have "meant that China had to build up its own defenses against possible future nuclear or chemical attack" (Jiang did not elaborate on the reference to a possible chemical stockpile).

Jiang remarked that since it was formed in 1950, China's special chemical defense force has built up its anti-nuclear, anti-chemical and anti-biological forces using more than 50 varieties of domestically manufactured equipment. He admitted, however, that China's chemical defenses still lag behind those of the developed nations.

Citing the internal security element of special defenses, Jiang stated that anti-nuclear and anti-chemical attack facilities form a "vital" relief task force in case

of industrial or natural disasters. He warned of the need to be prepared for nuclear accidents in China, which recently began constructing its first two nuclear power plants. He noted that the People's Liberation Army Chemical Defense Department and civilian organizations held a joint simulated nuclear contamination monitoring exercise in the northwestern city of Lanzhou in 1985 as part of China's defense efforts. Jiang described China's chemical plants as "posing further uncertainties" and natural disasters like earthquakes as "a constant nightmare." Such contingencies "make it evident that the buildup of an anti-chemical force is extremely important, even in peacetime."

Emergency Management Cooperation: As China began to institute its commercial nuclear industry, its civilian and military sectors began to cooperate on emergency management procedures. On 15 July 1993, the New China News Agency reported that China had held its first national training class for coping with emergency nuclear accidents. Held at "a certain anti-chemical weapons unit of the Guangzhou Military Region" from late May to mid-June, the training was "the first important step taken by [China] to enhance [its] ability to handle emergency nuclear accidents."

The news item noted that with the rapid development of China's nuclear power industry, particularly with the imminent testing and operation of the Daya Bay Nuclear Power Station, China had strengthened its ability to manage nuclear emergencies. In line with the specific measures produced by the State Council's nuclear power office, China reportedly instituted three specific measures.

First, it organized experts to step up scientific research on emergency nuclear accident relief, enhance academic theoretical research, prepare a number of valuable academic theses and finalize plans for emergency nuclear accidents.

Second, it increased research and production of crucial equipment and facilities for emergency nuclear accident relief; emergency relief units previously had only some equipment and facilities.

Third, it enhanced the training of emergency relief personnel and increased the number of emergency relief exercises to raise the expertise of these personnel.

The New China News Agency reported that 57 trainees from 37 units--including scientific research institutes and the People's Liberation Army--

participated in the training class, sponsored by the State Council's nuclear power office and the armed services section of the People's Liberation Army General Staff Department. The report described the training as in line with "instructions set forth by the State Council and the Central Military Commission on coping with emergency nuclear accidents."

China's training strategy included sessions for emergency personnel to attend lectures by technical experts, study typical relief cases from nuclear accidents worldwide, exchange experiences on preparations to cope with emergency nuclear accidents and visit the Daya Bay Nuclear Power Station. The training reportedly also enhanced the working relationship among personnel employed at the nuclear power stations, among the army and localities, and among professional relief units; it also helped train eclectic "backbone forces" for emergency nuclear accident relief.

Reserve Force Training: In addition to training its civilian and military sectors to coordinate on managing nuclear, chemical and biological disaster, China has also provided "specialized" training to its reserve forces so that designated civilians can support wartime operations requiring technical expertise.

On 27 April 1993, the New China News Agency reported that China had conducted its first large-scale field training exercise for reserve units to develop their ability to mobilize rapidly. The drill lasted three days and began immediately after China's command structure issued a "wartime emergency mobilization order" through local posts and telecommunications departments and through cable television and intercom systems at factories, townships and towns. Conducted in Xinzhou, Shanxi Province, several infantry and artillery regiments mobilized to assemble with a division of military vehicles to transfer efficiently to the operations area.

During a press briefing at the end of the drill, a People's Liberation Army General Staff Department spokesperson said that in the ten years since China established formal army reserve units, such units have expanded to the three major services to include scores of arms, such as artillery, tanks, engineer corps, an anti-chemical warfare unit and a signal corps. In China's view, the drill showed that the combat effectiveness of army reserve units had been enhanced, that they can serve as an established military service to reinforce the field army or independently carry out battle missions during wartime. The spokesperson concluded by saying that reserve forces now play a significant role in safeguarding China's national security.

Military Civil Relief Operations: Specialized units of China's armed forces have also participated in civilian emergency relief operations involving nuclear, chemical and biological threats. The New China News Agency reported on 3 August 1986 that the People's Liberation Army claimed its chemical corps had achieved "world standards" in its ability to deal with nuclear and chemical threats.

A People's Liberation Army spokesperson said that it established a Chemical Corps (later described in media accounts as an Anti-chemical Corps) to defend against attacks by invaders with nuclear and chemical weapons. As such, the Chemical Corps has participated in all of China's nuclear tests and completed related effect tests and safety protection missions. The spokesperson cited the Chemical Corps' successful disinfection of Tangshan, Hebei Province, immediately after the city was devastated by a 7.8-magnitude tremor on 28 July 1976. According to the spokesperson, "no pestilence hit Tangshan after the quake, partly because our soldiers sprayed 700 tons of disinfectants there."

The officer also claimed that China's Chemical Corps had helped manage radioactive and chemical leakage accidents (note: this is a surprising admission by any official authority). The officer said that the Chemical Corps, equipped basically with Chinese-made equipment, completed 277 scientific and technological tasks between 1981 and 1985; China's Anti-chemical Warfare Academy had 14,000 graduates by the end of 1986.

4. *Military Training:*

Military Modernization: China's armed forces have undergone a substantial modernization since the end of the Cultural Revolution. A 20 September 1984 article in the *People's Daily* reported President Yang Shangkun's comments on China's military as part of the 35th Anniversary of the founding of the People's Republic of China.

Yang described China's army as having matured into a modern combined military force that used the development of military science and technology to establish many new armed services and branches. He cited the level and quality of the combination of various armed services and branches as a major criterion for judging the degree of the army's modernization.

Yang outlined the army's development since China earned its independence. He characterized the army structure as developing in three major stages. First, during China's prolonged revolutionary wars, China basically relied on the infantry; this was an era when China had only one service arm. After China's founding, the army entered its second stage--establishing its air force, navy, artillery, armored force, engineering units, railway engineering corps, signal corps, anti-chemical warfare corps and strategic missile units--to develop the sole arm of infantry into a military force of combined arms. The third stage, within which the armed forces are now developing, includes full professionalization and a regularization of units as a combined military force.

Yang cited China's modernization of weaponry and equipment as an important component of efforts to modernize the army. In China's early years of war, the weaponry and equipment of the army came mainly from "war trophies." After the founding of the People's Republic of China, the army moved from weapons replication to indigenous production. Yang noted that by relying on its own strength and "painstaking efforts," China successfully produced new models of heavy-caliber cannons, tanks, armored vehicles, fighter planes, warships and other conventional weapons to equip its troops with suitable weapons. In addition, Yang cited China's success in making "defense-purpose" atom bombs, hydrogen bombs and such strategic weapons as intermediate-range and long-range missiles, thus forming an initial system for developing, testing, producing and guarding against strategic attack.

As China's military continues to mature in its third phase of development, Yang suggested that a modern army is an area where new science and technology is highly intensive. Thus, he described the army as needing a large number of talented personnel who have a good education and sufficient scientific knowledge. Yang, however, also noted that China needs to build a modern army with Chinese characteristics--requiring revolutionary verve and a guarantee of political work.

A few months earlier, on 30 July 1984, the New China News Agency reported that the People's Liberation Army's organizational system was becoming more rational, scientific and capable of meeting the needs of a modern war. The article also described the army as having matured in three stages. Stage three was described as an effort "to coordinate various arms and services and, in accordance with the principles of streamlining and combining troops, integrating peacetime production with preparedness against war and raising efficiency, to step up the

efforts to build new technical units and reserve forces." Along with the rapid development of new arms and services, the army reportedly also developed a combined rear service comprising a variety of specialties and sophisticated technology.

Concerning military modernization, the report cited China's services as having incorporated a significant amount of new electronic, communication, engineering and anti-chemical warfare equipment. Therefore, the army reportedly has considerably raised its firepower while also increasing its ability to attack, mobilize, defend and respond quickly and efficiently.

Unlike Yang's comments, the New China News Agency credited Deng Xiaoping for fostering much of China's military modernization. When Deng became head of the Central Military Commission in 1978, he reportedly emphasized the role of modern military training. In modernizing army training programs, China concentrated on training its cadres, mainly in coordinated campaign tactics and in armored and airborne exercises. It organized, "at various scales and with various tasks," simulated ground, naval and air exercises with real troops under modern conditions, as well as "nuclear counterattack" exercises. The ability of ground, naval and air forces to "coordinate with each other in combat, react quickly, counter electronic surveillance, ensure logistic supplies, and survive in the field" reportedly has also greatly improved.

The August 1992 edition of the *Beijing Review* revealed how China's military modernization effort had impacted its force composition. The article claimed that specially-equipped troops accounted for about 60 per cent of the armed forces, significantly different from the earlier composition as a mostly infantry force. The article claimed that specialist units could be found in the artillery, engineering, armor, signals, anti-chemical warfare, electronic counter-warfare and strategic missile forces.

Many years earlier, on 5 February 1980, the *People's Daily* carried a newsletter describing the modernization of People's Liberation Army units in Beijing. The article described how the units had "discarded their outmoded teaching apparatus in favor of electronic, audio-visual educational aids and power-driven diagrams and charts." Training was in accordance with learner aptitude, not, as in the past, by "irrationally mixing different kinds of tactics and setting hard and fast

requirements on the soldiers without regard for their different abilities." The new methods reportedly produced capable, well-prepared soldiers.

The article described a visit to "a training base on a snowy plateau" where there were "tanks, artillery pieces, target drones, parachute targets, sand tables and all-purpose demonstration gadgets." The reporters witnessed a combined arms exercise of tanks, infantrymen, poisonous gas and the anti-chemical warfare corps.

The article said the Beijing units also staged an exhibition to demonstrate progress made in scientific and technological research. The exhibits included "collapsible and well-equipped anti-chemical warfare protective tents" which when not in use, fold into a one cubic foot wooden box.

National Defense Projects: By 1987, China began to report on its successful completion of national defense projects. On 1 February 1987, the New China News Agency reported that in response to the threat of nuclear war, China had constructed "an almost complete system of national defense projects" that are "reasonably distributed, on an appropriate scale, of a complete array of types, equipped with complementary facilities, and reasonably strong in defense capability." These projects reportedly included a system of strategic command projects to ensure automated combat command operations. The system included a survival capability to support the counterattack ability of China's strategic nuclear forces and strategic air and naval force bases. The civil air defense component of the projects were "designed to protect the country's political, economic, industrial and communications centers."

A member of the New China News Agency reportedly visited a command project "in a certain locality"; he reported that the project was equipped with "complete telecommunications, water drainage, independent power supply and other facilities." He claimed that when cut off from the outside world, its personnel could survive and carry out "stable and uninterrupted command operations." Project staff officers informed the reporter that the facility had the capacity to protect itself from nuclear blasts, conventional bombs and chemical toxicants. China reportedly achieved valuable research results into protecting its national defense projects against nuclear, conventional, chemical and biological weapons.

Field Training Exercises: In the ensuing years, China expanded its claims of command and control survivability against nuclear and chemical attacks; by 1988,

news accounts added "biological weapon survivability" to the claims. The New China News Agency reported on 8 June 1988 that military maneuvers of an unspecified group army of the Beijing Military Region demonstrated that the Chinese army could protect itself from nuclear, chemical and biological weapons and accidents (note: the addition of "accidents" corroborates the military role in civil emergency management). The report indicated that the group army--involving infantry, armored and artillery units; engineer corps; radar forces; and anti-chemical warfare units--carried out maneuvers commanded under the Headquarters Element of the People's Liberation Army General Staff. The exercise, demonstrating that the army can check the use of massive anti-personnel weapons and perform rescue work in the event of a nuclear "accident," reportedly also enhanced the army's protective ability as an "important part of peacetime training."

On 4 July 1988, the overseas edition of the *People's Daily* reported that the People's Liberation Army had conducted a simulated nuclear and chemical war to test defense capabilities. The article reported that a "two-hour mock battle" was held in late-June at an undisclosed naval base in the East China Sea. It was also unusual in that it occurred at night.

The exercise began with the detonation of a simulated nuclear explosion that released a simulated mushroom cloud into the night sky. Air force bombers then made simulated nuclear and chemical attacks on the naval base. The East Sea Fleet and base artillery units "organized effective firepower to counterattack" and took protective action against the "radioactivity and chemicals."

The *People's Daily* said it was the first time the navy conducted such a maneuver, which tested the ability of command structures, ships and artillery to defend against a nuclear attack. The mock battle began when "enemy" planes launched an attack on the base, which was defended by troops wearing "anti-nuclear clothing." Anti-chemical warfare troops reportedly also took part with officers, including Deputy Naval Commander Chen Mingshan, who watched the maneuvers on a television screen. The article did not elaborate on the exercise.

China conducted another simulated nuclear and chemical warfare exercise a few months later. The New China News Agency reported on 22 October 1988 that China's military preparedness against chemical warfare had been tested in an exercise of the People's Liberation Army chemical defense units.

The exercise, termed the largest since the "Big Contest of Strength" in 1964, took place under simulated nuclear and chemical weapon attacks. According to the news reports, "China's chemical defense scouts, observation forces, clean-up forces and Chemical Defense Command officers from all military regions demonstrated that they are well trained, and that the Chinese chemical defense forces are capable of providing chemical defense during a nuclear or chemical war launched by any invader."

The exercise reportedly closely resembled an actual battle and ensured the combined armed forces' movements on a battlefield undergoing modern nuclear and chemical attack. After being strongly rebuffed by allied "Red Force"' front-line troops, the invading "Blue Force" appeared ready to use nuclear weapons. Lanzhou Military Region chemical defense forces "promptly dispatched their observation unit known as the eyes and ears of the chemical defense forces to confirm the information."

The New China News Agency reported that the "Blue Force" launched a simulated "nuclear attack." The "Red Force" responded by establishing observation posts to monitor and collect all data on the explosion. "Within minutes" they delivered all pertinent the information to the command center, supplying the commander with first-hand information to support defense decisions based on his judgment of the power and location of the explosion as well as how the device was detonated.

The article noted that the commander of the Nanjing Military Region chemical defense units was in charge of carrying out missions assigned to the "Red Force" headquarters. At the chief of staff's proposal to take immediate action to protect the units and people in down-wind contaminated areas, the commander reportedly ordered chemical defense scouts and clean-up forces to carry out the mission. The article noted that all commands were issued within 20 minutes, an indication that should the enemy launch a nuclear attack in a future war, the "well-trained People's Liberation Army would be able to provide prompt and effective defense."

The article also revealed basic information on China's anti-chemical equipment. During the chemical phase of the exercise, China employed its camouflaged decontamination scout vehicles and vehicles equipped with sprayers and showers. Major-General Jiang Zhizeng, commander of the exercise, stated that

China's military chemical defense equipment is basically complete, comprised of modern, indigenously-produced equipment. According to Jiang, who also took part in the 1964 contest among China's chemical defense forces, the chemical defense scouts in those days had no vehicles or radiation detection equipment. In contrast, today's armed forces use various means to promptly detect all types of known chemical toxicants for military use. As a result, China's armed forces reportedly can "match well-equipped foreign counterparts so long as they intensify training, accumulate more experience and further master technical equipment."

The chemical defense exercise ended reportedly with the "firing of red and green signal flares," the showering and spraying of vehicles, and the simulated "decontamination of personnel, areas and large weapons." Within minutes, the Jinan Military Region chemical defense troops reportedly finished cleaning up all contaminated vehicles; radiation detectors indicated all vehicles were cleaned according to standards.

The New China News Agency article ended by concluding that the chemical defense forces exercise, conducted against the background of fighting a combined tactical warfare, improved the army's ability to provide chemical defense in time of war and emergency assistance in time of peace. The exercise also demonstrated that the Chinese defense forces have become an indispensable part of all the modern services and arms of the People's Liberation Army in fighting a combined arms battle.

On 16 December 1991, Hong Kong's *Ta Kung Pao* daily reported that China conducted yet another simulated nuclear war exercise. The article noted that after China began to streamline and reorganize the People's Liberation Army in 1985, the military structure of infantrymen as the main component ended after 58 years in favor of combined group armies (note: a 25 November 1986 article in *Ban Yue Tan* revealed that China's group armies are combat corps formed from various types of ground troops; the main responsibility of group armies is to carry out combat tasks in a "certain battle direction (region)"; although the class and competence of the group armies are equivalent to those of the past field armies, their "comprehensive combat capability" is much stronger than that of field armies in the past. The present group armies reportedly consist not only of infantry and motorized divisions (mechanized infantry divisions), but also tank divisions (brigades) and a number of artillery troops, anti-chemical corps, antiaircraft artillery troops, engineering corps, signal corps, reconnaissance troops, electronic corps, logistics units and logistic

support troops. Some group armies also have helicopter troops). After six years of training, an unspecified group army of the Beijing Military Region conducted a large-scale, combined arms exercise for the military leaders of other north China units.

The exercise, also using the scenario of an exploded atomic bomb, included the transport of fully-armed infantrymen and chemical defense troops in armored vehicles. After the explosion of the simulated atom bomb, "chemical defense vehicles" reportedly rushed to the scene through the smoke to detect chemical reactions. Spray vehicles followed suit to conduct sterilization, thus opening up a path for the troops to follow.

The military exercise lasted for an hour and 40 minutes, with "reconnaissance soldiers gathering information, electronics units carrying out interference, medical orderlies providing first aid, communications stations going into operation and engineer troops removing mines." Of the 40 military training subjects conducted by some 20 different service arms during the exercise, 35 reportedly earned excellent marks.

Military News Releases: China often reports its military training exercises in state-run media, largely to "advertise" its military capabilities internationally. The 2 August 1992 edition of the Hong Kong *Ta Kung Pao* daily provided a special dispatch from Haikou. The article revealed a 28 July military exercise on Tunchang, Hainan Island, where units under the Hainan Military Command displayed their combat capability to celebrate the 67th Anniversary of the People's Liberation Army. Myriad ground units and ground-based weaponry participated in the demonstration.

On 3 August, Hong Kong's *South China Morning Post* reported that the exercise was largely a show of force to warn Vietnam and Taiwan of growing Chinese military might. In what analysts said was the most spectacular war game staged on the island since the Cultural Revolution, the Hainan Military District "paraded a stunning array of state-of-the-art weaponry at a base in Tunchung." Hainan had since 1949 provided key bases for the Chinese Navy and Army patrolling the South China Sea and the Gulf of Tonkin. With China more aggressively pursuing disputed territories in the South China Sea, the defense exercise amounted to a show of military force. The maneuvers reportedly included

rocket launchers, cannons, mortars, antiaircraft guns and anti-chemical warfare equipment.

China also advertises the capabilities of the specialized units of its armed forces. On 6 January 1992, People's Liberation Army Chief of Staff General Chi Haotian said that the amphibious combat capability of the Air Force paratroop units has markedly improved. Chi Haotian made this remark after viewing a military exercise staged by an unnamed Air Force paratroop unit.

Chi noted that to adapt themselves to requirements of amphibious combat, paratroopers have in recent years carried out combat training in different terrain and under adverse weather conditions. He described their combat skills as enabling them to accomplish various missions: fighting in north and south China, on islands and plateaus, in conventional and unconventional wars. While training, airborne units reportedly are often "airlifted to a designated area several thousands miles away from their stationed area to carry out parachuting missions." This helps raise their capability to adapt to conditions similar to actual combat. It also helps them "study various regions, acquaint themselves with different weather conditions and experience various combat situations."

Finally, Chi noted that all officers and men of the special unit have more than one skill: "they are expert parachutists; they operate various kinds of vehicles; they are weapons experts; they have engineering knowledge; and they can operate anti-chemical and communications equipment."

In addition to enhancing the special capabilities of its airborne forces, China also upgraded the warfighting potential of its marine corps. A New China News Agency report from Guangzhou on 8 June 1987 claimed that the marine force of the People's Liberation Army is now a modernized force that can respond quickly and which is capable of maneuvers on land and sea. The corps, described as a "multi-faceted military division under the army's South China Sea fleet," boasts ground and engineering forces, an anti-chemical warfare corps and a telecommunications section. It is equipped with weapons for ground maneuvers and landing operations, and tanks and cannons for use on land and sea.

Huang Chaoshi, the Marine Corps' Commander claimed that military training on landing and anti-landing operations had raised the corps' combat ability to the

point where it now coordinates its training with other branches of China's armed forces.

Marine units reportedly have also trained for specialized combat. Huang noted that one training session in the Xisha Islands included ground and amphibious unit participation in "survival drills" with no food and fresh water. Wearing gas masks, the soldiers also conducted simulated combat drills for three and a half hours on a beach with a surface temperature of 55-60 degrees centigrade.

In addition to providing its military the equipment and training to operate in a nuclear, chemical or biological environment, China has also trained its specialized units under extreme conditions. The *Liberation Army Daily* reported on 16 December 1988, that Chinese troops recently successfully carried out maneuvers in high-altitude conditions. A unit of the People's Liberation Army concluded 83 programs consisting of 249 routine military training exercises in the Himalayan Karakorum mountains, 4,000-5,000 meters above sea level. Infantry, artillery, engineering, signals, chemical warfare and logistics units reportedly took part in live-fire exercises at elevations of more than 5,000 meters.

Earlier, on 6 August 1988, the New China News Agency reported that the People's Liberation Army had gained "new experience" in fighting in hot, damp weather through exercise maneuvers in Shanxi Province (north china). The exercise was staged by a group army under the Beijing Military Command in an area enclosed by mountains, where the surface temperature reached 53 degrees centigrade. According to military sources, the troops exercised their tank, armored, artillery, communications, reconnaissance and anti-chemical warfare skills in hot, damp weather and heavy rains. During the exercise, the army also found new ways of preventing heatstroke and protecting sophisticated weapons from being affected by high temperatures and humidity.

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THE CHINESE PERCEPTION OF CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 3:

TREATY INVOLVEMENT

OVERVIEW. Generally, China has acted responsibly in a variety of international venues concerning chemical and biological warfare issues. As a permanent member of the United Nations' Security Council, China has provided a significant degree of leadership on sensitive issues while remaining steadfast on matters crucial to national security. While demonstrating its resolve on issues of national import, China has also shown an ability to compromise on issues of international benefit. Conversely, China's bilateral deliberations with the United States on arms control have been less successful, following the ebb and flow of a generally stormy relationship stirred by complex issues, such as human rights, Taiwan reunification and alleged transfers of Chinese arms to North Korea, Pakistan and the Middle East.

1. The "Five Principles of Peaceful Coexistence":

China's chemical and biological arms control policy is a component of its broader philosophy on international relations. Since the 1950's, China has worked within the framework of a system it calls the "five principles of peaceful coexistence" (or simply the "five principles") to implement its international initiatives. The components of this strategy are:

1. Mutual respect for sovereignty and territorial integrity
2. Mutual non-aggression
3. Non-interference in each other's internal affairs
4. Equality and mutual benefit
5. Peaceful coexistence

On the eve of founding the People's Republic of China in 1949, Chairman Mao Zedong spelled out three principles as the basis for China's future international relations: equality, mutual benefit and mutual respect for

territory and sovereignty. China added "non-interference in each other's internal affairs" as a fourth principle in a Sino-Soviet pact signed in February 1950. In a December 1953 meeting in Beijing with an Indian government delegation, Premier Zhou Enlai instituted a fifth principle, that of peaceful coexistence. On 28 June 1954, China and India issued a joint statement affirming the "five principles of peaceful coexistence" as the basis of its bilateral relationship. Since then, the "five principles" have served as the underpinnings of China's position on all international issues. In 1982, China incorporated the "five principles" into the Constitution of the People's Republic of China.

The Chinese leadership proudly notes that many countries and international organizations accepted the "five principles" after the Bandung Conference in 1954, when ten principles were drawn up on the basis of the China initiatives. Fu Hao, China's former Deputy-Minister, noted in 1994 that the "five principles" played an important role in making China's voice heard across the world when China was blocked from the United Nations and relatively isolated. Former Deputy Foreign Minister Han Nianlong also notes that China's "five principles" have endured a variety of tests in a changing world where international relations "could not be handled fairly and reasonably in the forms of big family, group politics, power spheres or world leaders." Han added that the "five principles," emphasizing solving international conflicts through discussions and negotiations on equal an footing, have accompanied the changes in the developing world.

In June 1994, Wu Xueqian, Vice-Chairman of the National Committee of the Chinese People's Political Consultative Conference and former Foreign Minister, acknowledged the 40th Anniversary of the "five principles." A New China News Agency article quoted Wu as stating that the "five principles" are important in the international arena because "they go beyond the limits of social system and ideology, and conform to the principles of sovereignty and equality specified in the United Nations charter." Liu Shuqing, President of the Chinese People's Institute of Foreign Affairs and former Vice-Foreign Minister, added that the "five principles" have always constrained the practices of hegemony and power politics, reversing a global trend where "sovereignty is outmoded," and "human rights [are emphasized] ahead of sovereignty."

In the September 1989 edition of the *Beijing Review*, Foreign Minister Qian Qichen noted that China has always adhered to the "five principles" of peaceful coexistence and opposed any interference in the internal affairs of other nations. Qian stated that China's starting point in initiating and adhering to these tenets is that "all countries, big or small, strong or weak, rich or poor, should be equal, should respect each other, and should establish friendly cooperation and live in harmony." Qian added that the "five principles" are interrelated and dependent on each other. In 1994, Qian also warned that a failure to abide by these principles will lead to friction, confrontation or war.

2. The Stated Goal of China's Foreign Policy:

China's perception of chemical and biological warfare is a subset of its international strategy; therefore, it is important to examine the goals of the larger strategy.

According to Foreign Minister Qian Qichen, the overriding goal of China's foreign policy is to "safeguard world peace and win a long-term and peaceful environment for socialist construction." Accordingly, China has "resolutely opposed all variants of the arms race" and made proposals for the "complete prohibition and thorough destruction of nuclear, chemical and biological weapons and weapons deployments in outer space, as well as large-scale reductions of conventional weapons and military personnel." This is China's basic position regarding arms control.

In the September 1989 edition of *Beijing Review*, Qian pointed out that since 1986, the United Nations accepted two Chinese draft resolutions on the reduction of nuclear and conventional weapons. Qian suggested that China has not only taken a firm arms control stance, but has also reduced its own conventional military forces. Qian reiterated China's contention that when it first detonated a nuclear device on 16 October 1964, it unilaterally declared it would develop a limited number of nuclear weapons entirely for defense; China also declared that it would at no time or under any circumstances be the first to use nuclear weapons.

3. Disarmament Issues:

Background: China's contemporary strategy on disarmament dates to the end of the Cultural Revolution and the passing from the scene of Chairman Mao

Zedong and Premier Zhou Enlai. On 29 May 1978, Huang Hua, Foreign Minister and Chairman of the Chinese delegation to the United Nations, addressed the Tenth Special Session of the General Assembly on Disarmament by saying that China was ready to join the representatives of other countries in discussing disarmament in hopes to "make a positive contribution to the peoples' cause of unity against hegemony in defense of world peace."

Huang reviewed the history of disarmament initiatives since the end of World War II to criticize the United States and the Soviet Union for failing to stem the tide of cold war weapons escalation. Huang also pointed out that from the start of the "disarmament decade of the 1970s," many nations have engaged in myriad arms control negotiations under a variety of names to derive a number of disarmament statements, declarations, agreements, resolutions and treaties. Huang continued by saying that despite these successes, the arms race has continued to escalate.

Huang's speech followed the line of many Chinese statements on arms control, namely that the United States and the Soviet Union are responsible for the arms race and should aggressively work to reduce the threat such weapons pose to third world and other small and medium-sized countries. Under this strategy, China consistently depicts itself as a victim of the superpower conflict--a strategy which justifies China's maintenance of viable special weapon programs for defensive purposes.

Proposals on Superpower Disarmament: Huang also discussed the Chinese view of disarmament and its likely impact on arms control. He stated that China had provided the United Nations many reasonable proposals and suggestions for disarmament; these recommendations essentially consist of five main points:

1. a prohibition on the use of nuclear weapons
2. a destruction of nuclear weapons
3. an establishment of nuclear-free zones and zones of peace
4. a prohibition on all chemical and biological weapons
5. a prohibition on the establishment of military bases and stationing of troops on foreign soil

Perceptions on the Failure of Disarmament Initiatives: Huang stated that these initiatives would undoubtedly help consolidate international peace and security if the superpowers would faithfully adopt them. However, Huang also stated that China perceived the superpowers as "duplicitous" on disarmament, "saying one thing but doing quite another."

To criticize the arms control actions of the United States and the Soviet Union, Huang cited their a joint statement in 1961 which listed eight principles as a basis for disarmament negotiations and which spoke of "general and complete disarmament." Huang stated that after seventeen years, not a single principle of the joint statement is in practice. Furthermore, Huang claimed that the superpowers are not at all working for general and complete disarmament, but for general and complete arms expansion.

To support his claim, Huang pointed to the military expenditures of the United States and the Soviet Union. Huang claimed that totaling 40 and 20 billion dollars, respectively, in 1961, expenditures exceeded 100 and 120 billion in 1977--spendings roughly equal to the total military expenditures of all countries of the United Nations. Huang particularly criticized the Soviet Union for the biggest strides in the arms race, far outpacing the United States in expanding its strategic force.

Reasons for Disarmament Failures: Huang outlined three primary reasons for the failure of disarmament initiatives put forward by the United Nations..

First and foremost is a lack of sincerity on the part of the superpowers towards arms limitations. In China's view, the superpowers invariably had camouflaged their arms expansion with rhetoric about disarmament. Accordingly, Huang suggested the United Nations "not give credence to fine-sounding words but call on practical measures of disarmament."

Second is that although the world wants genuine disarmament, the superpowers have used "disarmament hoaxes" to lull world into thinking strategic arms were being brought under control and to "tie the hands" of other countries with limited strategic weapon capabilities. Huang suggested the United Nations "constantly expose these hoaxes" so that they do not confuse the issue.

Third, Huang suggested that the superpowers will not accept in good faith any proposal for genuine disarmament. Even if some agreements are reached, the superpowers would refuse to be bound by their terms. Therefore, Huang suggested the United Nations not entertain illusions about disarmament and superpower commitment to verifiable arms control pacts.

Recommendations for Authentic Disarmament: Following Foreign Minister Huang Hua's criticism of the superpower arms race, he called upon all countries to declare that they will "prohibit and destroy nuclear weapons completely, thoroughly, totally and resolutely, that is, no use, no export, no import, no manufacture, no testing, no stockpiling of nuclear weapons and the destruction of all existing nuclear weapons."

Huang noted that China had proposed a conference of the heads of all countries to discuss "a complete prohibition and thorough destruction of nuclear weapons, and first of all to conclude an agreement on the non-use of nuclear weapons." Huang chided the superpowers for not responding to China's suggesting and for continuing talks on nuclear disarmament that "have been going on for more than a dozen years without any substantive progress."

Huang stated China would propose five actions the United States and the Soviet Union take to achieve authentic disarmament and reduce the threat to other nations. He continued by stating that only when the United States and the Soviet Union achieve progress in the destruction of nuclear weapons and in the reduction of their conventional weapons should the other nuclear countries destroy their nuclear forces.

4. China's Disarmament Working Paper:

Several weeks after Foreign Minister Huang Hua's comments, Zhen Zhu, Vice-Chairman of the Chinese delegation, submitted a working paper on disarmament to the General Assembly. Dated 7 June 1978, the paper was China's input into the final document of the Committee on Disarmament. The input affirmed Huang's remarks in accordance with China's "five principles of international peace and security." The text, citing questionable superpower sincerity on disarmament, recommended the United States and the Soviet Union adopt the following "concrete measures" to reduce their massive arsenals and renounce the use of military threats against other countries:

1. declare that at no time and under no circumstances to resort to the threat or use of nuclear weapons against non-nuclear countries and nuclear-free zones.

2. withdraw all armed forces stationed abroad and undertake not to dispatch armed forces to other countries; dismantle all military bases and paramilitary bases on foreign soil and undertake not to seek new ones.

3. stop the nuclear and conventional arms race and set out to destroy by stages nuclear weapons and drastically reduce conventional weapons.

4. undertake not to station forces or stage military exercises near the borders of other countries; undertake not to launch military attacks, including surprise attacks, against other countries on any pretext

5. undertake not to export weapons to other countries to bring them under control or to foment war or abet threats of war.

The China delegation's 12-point working paper reiterated China's willingness to commit to a policy of not resorting to the threat or use of nuclear weapons against the non-nuclear countries and nuclear-free zones. The document not only stated that China was ready to undertake this commitment but also reiterated that China would at no time and under no circumstances be the first to use nuclear weapons. The document stated that the Chinese government and people have always been in favor of genuine disarmament. It has supported all rational disarmament proposals and has put forward a number of its own; moreover, it has taken a series of concrete measures which accord with the desire of the people of all countries. The document concluded by reiterating that China was "ready to make continual efforts together with the other third world countries and the small and medium-sized countries to promote genuine disarmament."

Argumentative Principles: Huang Hua's address and the Chinese working paper reiterated several argumentative principles the Chinese adopt when discussing disarmament.

First, China assumes the role of defending what it refers to as the "small and medium-sized countries of the world." The Chinese never depict

themselves as a military superpower; they rather "defend" the relatively defenseless members of the United Nations against further superpower arms escalation.

Second, China consistently calls for a complete prohibition of special weapons by criticizing partial arms control pacts. China points to proposals such as a "complete prohibition of testing" and "consolidation of the system of non-proliferation" as not affecting the special weapons arsenals or restricting the production, development, stockpiling and use of special armaments. Huang reconfirmed this view by claiming that non-proliferation will not reduce the threat of war because the threat resides with the superpowers and their deployed weapons, not from the other states of the United Nations. Huang cited the "Partial Nuclear Test Ban Treaty" and the "Treaty on Nuclear Nonproliferation" in the 1960's as hampering the many non-nuclear countries and their right to the peaceful use of atomic energy, while the superpowers continued to aggressively expand their nuclear armaments.

Huang also voiced China's concern that the "successes" of the Strategic Arms Limitation Talks (SALT) were a "deliberate falsehood." Huang said that "for anyone willing to face up to realities, the history of SALT since it began in 1969 is a history of a strategic arms race between the Soviet Union and the United States, no more and no less." He noted that the previous SALT agreement reached after "[lengthy] bargaining provides neither for reduction in quantity nor restriction on quality, but was designed to ensure expansion and improvement of their strategic arms to a higher level." Huang noted that the superpowers have competed with each other in improving their strategic arsenal and rapidly developing multiple independently-targetable re-entry vehicles (MIRVs) and new types of strategic weapons, such as backfire bombers, cruise missiles and mobile multiple-warhead missiles. Huang noted that in the eight years of SALT, the Soviet Union developed its nuclear arsenal to a par with that of the United States. Huang expressed China's view that any forthcoming agreement between the Soviet Union and the United States would at best be one with quantitative but no qualitative limits.

Third, China constantly works to burden the superpowers with the primary responsibility to disarm. Huang stated that China viewed it as "only natural that an increasing number of small and medium-sized countries should

demand that disarmament begin with the reduction of the arms of the two superpowers, whose nuclear as well as conventional arsenals far exceed any other country in the world." Huang criticized both superpowers for having thousands of strategic nuclear weapons, tanks, military aircraft, warships and conventional weapons. He further criticized the competition for military supremacy, citing the development and commissioning of more sophisticated nuclear and conventional weapons; the augmentation and strengthening of ground, sea and air forces; and the expansion of military bases and facilities abroad. Huang used these numbers to argue that disarmament must start with the two superpowers; only reductions in their arms possession will bring about real progress in disarmament.

Fourth, China portrays itself as a peaceful and developing nation. Huang claimed that the Chinese people and the people of all other countries of the world firmly demand peace. Huang reiterated the "five principles of peaceful coexistence," which remain the foundation of China's global strategy even in 1995. Huang pointed out that China threatens no nation and is a non-aggressor. He portrayed China as a developing socialist country of the "third world," a nation opposed to global conflict and working to rise from economic backwardness. Huang stated that the Chinese people badly need an enduring peaceful international environment to facilitate its development into a modern and powerful socialist country by the end of the century. Huang depicted China as "socialist" but not "social-imperialist"; he described China's strategic weapons program as "war preparedness not intended for aggression but for defense against aggression."

Recommendations on the Objectives of Disarmament: By the following year, China had increasingly emphasized the need for the United States and the Soviet Union to lead the way in global disarmament. On 15 May 1979, Lai Yali, Chairman of the Chinese Delegation to the United Nations Disarmament Commission, pointed out that whether drawing up a program or negotiating the disarmament question, the United Nations should "follow the basic principle that the two superpowers should be the first to reduce their armaments; this principle should be applied in all aspects of disarmament and should be the chief criterion to judge whether there is real progress in disarmament."

Objectives, Principles and Requirements: Lai also delivered China's proposal on the elements of a comprehensive program of disarmament.

Working within China's "five principles of peaceful coexistence," Lai expressed China's disarmament concerns as having three categories: objectives, program principles and requirements:

a. Objectives: China claims that a comprehensive program of disarmament must "formulate reasonable principles and practical and effective measures for disarmament" to promote "real progress" in arms control, oppose all armed aggression and safeguard international peace and security.

b. Principles: Lai delivered China's 10-point program on arms control:

First, to safeguard international peace and security, relations between states must be based on China's "five principles of peaceful coexistence." Moreover, China proposed that no state may seek hegemony in any form and in any part of the world or subject other states to aggression, interference, subversion, expansion or control. China also proposed that no disarmament measure impair the sovereignty, independence and security of any state.

Second, to safeguard the security of all states, China proposed that the superpowers, with the largest nuclear and conventional arsenals, incur the primary responsibility for disarmament. China suggested that only when the superpowers have drastically reduced their nuclear and conventional armaments and closed the gap with the other nuclear states and militarily-significant states should the other nuclear states and militarily-significant states reduce armaments by reasonable ratios.

Third, China claimed it was imperative to bring about a complete prohibition and total destruction of nuclear weapons so as truly to eliminate the dangers of nuclear war. While nuclear disarmament is being considered, equal importance should be given to the question of reducing the superpowers' arsenals of conventional armaments; disarmament in these two fields should be carried out in conjunction. The Chinese suggested the United Nations also incorporate the prohibition and destruction of biological and chemical weapons and other weapons of mass destruction.

Fourth, the Chinese proposed that the actual process of disarmament benefit the economic and social development of states. The Chinese pointed out that the superpowers have spent huge sums on the arms race, not only

increasing the danger of war and jeopardizing international peace and security, but also hindering the establishment of a new international economic order. Because these military expenditures accounted for two-thirds of the military budgets of all countries put together, the Chinese suggested they be the first to reduce their military expenditures and to redirect these funds to the developing countries.

Fifth, China recommended that no disarmament measure prejudice the right of states to pursue modern scientific and technological achievements to promote their economic development. China suggested the United Nations prevent the superpowers from using disarmament and the non-proliferation of nuclear weapons as pretexts to deprive other states of their right to use nuclear energy and develop their nuclear industries for peaceful purposes.

Sixth, China recommended the United Nations emphasize limited-scope measures when forming more comprehensive disarmament measures. China recommended "zones of peace" or "nuclear-weapon-free zones" in light of "specific conditions" prevailing in different parts of the world and the desires of the states in the regions concerned." China suggested that these zones be free from rivalry for hegemony between the superpowers, foreign military presence in all its forms, armed occupation of territory, direct or indirect armed intervention and the threat of force. Furthermore, China suggested all nuclear states unconditionally undertake not to use or threaten to use nuclear weapons against these zones.

Seventh, China stated that questions of disarmament concern the security and interest of all states and should be discussed and settled by all nations on an equal footing. China recommended that the United Nations democratize the organization and procedures of its disarmament bureaucracy to free it from superpower manipulation and control.

Eighth, China recommended the United Nations strengthen its role in the field of disarmament, with the General Assembly remaining informed of progress in all bilateral and multilateral disarmament negotiations. Moreover, all parties to disarmament negotiations should earnestly consider and respect the recommendations to the general assembly.

Ninth, China recommended that all disarmament agreements provide for strict and effective measures of international control to ensure their

effective implementation; no control or verification measure should prejudice the sovereignty and security of any state.

Tenth, China recommended the United Nations inform the people of the world about the intensification of the arms race between the superpowers, the increasing danger of war and the lack of progress in disarmament to get active worldwide participation in the struggle for disarmament and the defense of world peace.

c. Requirements: The final component of the Chinese input to the United Nations Disarmament Committee addressed six requirements of an arms limitation pact:

First and foremost, the Chinese addressed nuclear disarmament by stating that any disarmament pact should claim "the complete prohibition and total destruction of nuclear weapons and their means of delivery" as its ultimate aim. The Chinese proposal suggested that pending agreement by the nuclear states on the non-use of nuclear weapons, all nuclear states, the two states with the largest nuclear arsenals in particular, should unconditionally undertake not to use or threaten to use nuclear weapons against the non-nuclear-weapon states and nuclear-weapon-free zones. Finally, the superpowers should immediately stop the nuclear arms race, cease all activities aimed at improving the quality and increasing the quantity of their nuclear weapons and begin to reduce and destroy their nuclear weapons by stages. The Chinese reiterated their claim that when the superpowers have substantially reduced their inventory of nuclear weapons, thus closing the huge gap between their nuclear arsenals and those of the other nuclear states to the satisfaction of the majority of states, the other nuclear states shall then join them in negotiations for the total destruction of nuclear weapons.

Second, the Chinese recommended the reduction of conventional weapons be a large component of an arms limitation pact. As a step preceding the reduction of conventional weapons, the Chinese proposed that the superpowers renounce military intervention in the threat of force against other states, both direct and indirect, withdraw all their troops stationed abroad and dismantle all their military bases on foreign soil. Moreover, the Chinese suggested that the superpowers first greatly reduce their conventional weapons and equipment by reducing the number of heavy weapons, such as tanks, aircraft, warships and artillery. When substantial progress has been

made in this regard, the other militarily significant states should join them in reducing conventional armaments according to reasonable ratios.

Third, the Chinese recommended a prohibition of chemical and biological weapons by claiming that all chemical and biological weapons be totally destroyed and completely prohibited; pending the attainment of this goal, all states should unequivocally undertake not to use any chemical or biological weapons. China also recommended the United Nations negotiate and sponsor a convention as soon as possible on the complete prohibition and total destruction of all chemical and biological weapons.

Fourth, the Chinese recommended a prohibition of all new weapons of mass destruction, suggesting that the two superpowers immediately stop the research, development and production of all new weapons of mass destruction and renounce their use.

Fifth, the Chinese put forth specific proposals on the establishment of "zones of peace." Specifically citing a request of the states in the region, China recommended Southeast Asia as a "zone of peace, freedom and neutrality." China recommended the United Nations prohibit all attempts by states to seek any form of hegemony in this zone; it also suggested all nations withdraw all foreign troops in this region; dismantle all foreign military bases; and eliminate all foreign aggression, expansion, interference and control. Specifically, China cited the Indian Ocean as a zone of peace that all states should respect, the two superpowers in particular. China also recommended that in conforming with the desires of the countries in the region, the United Nations declare the Mediterranean as a zone of peace.

Sixth, China recommended the United Nations establish "nuclear-weapon-free zones," stating that all nuclear states should respect this status and unconditionally undertake not to use or threaten to use nuclear weapons against these areas. The Chinese cited Latin America as a nuclear-free zone; they cited the Middle East, Africa and South Asia as other candidates.

China's Position on Disarmament: On 21 October 1991, Chinese Ambassador for Disarmament Affairs Hou Zhitong reiterated China's position on various disarmament issues. Speaking before a committee on politics and security, Hou said "peace, security and disarmament are closely linked with

the establishment of a new international order; therefore, to stop the arms race and realize effective disarmament is an important component part in the efforts to establish a new world order." He reiterated China claim that it has long opposed the arms race and stands for the complete prohibition and thorough destruction of nuclear, space, chemical and biological weapons and banning research and development of any new type of weapons of mass destruction.

China's Position on Military Bases Abroad: Hou's comments to the United Nations included a claim that China has always stood for the dismantling of all military bases on foreign soil and the withdrawal of all armed forces stationed abroad. Hou pointed out that China has no military bases or troops abroad; he also stated that China would never ask any country for military bases or station Chinese troops on the territory of any other country.

China's Position on Chemical and Biological Weapons: Hou noted that China has always stood for the complete prohibition and thorough destruction of biological and chemical weapons (note: China usually mentions biological weapons first when discussing chemical and biological warfare). He continued by saying that China firmly uphold the 1925 Geneva Protocol for the prohibition on the use of chemical and bacteriological munitions.

China's Position on Nuclear Energy: According to Hou, China feels that all countries have the right to develop nuclear energy for peaceful purposes; as such, China firmly opposes an superpower attempts to hamper on the pretext of nuclear non-proliferation the development by other countries of their own nuclear industry.

China's Position on Space Disarmament: Concerning disarmament in general, China has long criticized the United States and the Soviet Union for their failure to achieve "meaningful and genuine disarmament." As early as October 1984, such criticism included the exploitation of space. On 23 October, Chinese Ambassador Qian Jiadong appealed to the two superpowers to "change their course of action, abandon their policies of contending for world hegemony from positions of strength, ease their strained relations and start negotiations in earnest in order to achieve genuine disarmament."

As the cold war arms race threatened to extend into space under the Reagan administration's Strategic Defense Initiative, China perceived its

strategic position in the global arena as further diminishing. Speaking before the First Committee of the General Assembly, Qian, Deputy Permanent Representative to the United Nations in Charge of Disarmament Affairs, pointed out that China was particularly concerned about "the increasing risk of their extending the arms race to the outer space, which if unchecked, will bring about the danger of turning the tranquil outer space into a fourth theater of war, after those of land, sea and air."

5. Reaction to the Intermediate-Range Nuclear Forces (INF) Treaty:

China has been cautiously optimistic about the disarmament successes of the United States and the Soviet Union.

Reacting to the signing of the Intermediate-Range Nuclear Forces (INF) Treaty in December 1987, the Chinese Foreign Ministry stressed that the treaty "made only a small dent in the nuclear inventories of the superpowers and has not reduced the threat of nuclear war." Ms. Li Jinhua, a Foreign Ministry spokesman, said China welcomes the official signing of the INF Treaty as the first step toward nuclear disarmament. However, she added that China expects both nations to pursue talks that will lead to even greater cuts in nuclear weapons.

China adopted a similar tone in a front-page editorial of the *People's Daily*, the official Communist Party newspaper (comments did not appear in other papers). The editorial stated that the INF agreement was "far from reducing the risk of nuclear war and cannot fundamentally reduce international tensions."

Despite the accord, which would eliminate 171 SS-20 missiles located in Soviet Asia and within striking distance of China, the Chinese New China News Agency reported that there was "no grounds for optimism." The article claimed that "crux of the problem is that neither side appears to have changed its fundamental policy of seeking strategic superiority."

6. Perception of Weapons in the Middle East:

China is highly interested in the arms control initiatives the United Nations has proposed toward the Middle East. It is well known that China has numerous relationships with the nations of the Middle East on petroleum

and petrochemical development, trade and conventional military arms sales. Although not corroborated in the open media, these relationships possibly also include cooperation in nuclear, chemical and biological weapons technology.

Publicly, China's Foreign Ministry has the task of presenting China as a responsible member of the international community. In helping resolve global issues as an elite "Big Five" member of the United Nations, China's actions often run counter to its "five principles" and national interests.

On Middle East disarmament, China's Foreign Ministry announced on 26 April 1990 its support of Egypt's proposal that the Middle East become a region free of destructive weapons. A Foreign Ministry spokesman said that the "countries concerned in the Middle East [could] reach an agreement in this regard through consultation and on a voluntary basis; it would contribute to the Middle East peace process and to the stability and peace in the region." The Ministry suggested Israel, the most powerful country in this region in terms of military strength, should "take the lead."

On 17 June 1991, a Foreign Ministry spokesman claimed that China "always stands for a complete prohibition and thorough destruction of such weapons of mass destruction as nuclear, chemical and biological weapons and supports the effort to turn the Middle East into a nuclear-weapon-free zone and a zone free from weapons of mass destruction." The spokesman made the statement at a weekly press conference in Beijing when asked about China's position at the Paris Conference of the five permanent members of the United Nations Security Council on Arms Control in the Middle East.

The Foreign Ministry characterized the Middle East as "a hot spot of lasting tensions." It continued by stating the China favors stability in the region based on low-level armaments. It stressed that this undoubtedly requires the joint efforts of countries in and out of the region to halt the huge influx of weapons into the area. Therefore, "those countries which have exported a great amount of arms to this region should, first and foremost, take a responsible attitude and seriously exercise self-restraint."

7. Views on the "Gulf War" Ceasefire Proposals:

As a permanent member of the United Nations Security Council, China plays a major role in resolving the important issues of the Middle East. On 3 April 1991, China voted to support the United Nations Security Council's Formal Gulf War Ceasefire Resolution (Resolution 687). According to the New China News Agency, China's actions were in accord with its "consistent position of opposing the Iraqi invasion of Kuwait and standing for a peaceful settlement of the gulf crisis."

Speaking at the United Nations Security Council after the voting on the ceasefire resolution, Ambassador Li Daoyu, Chinese Permanent Representative to the United Nations said that China stood for an early realization of a formal ceasefire, the deployment of a United Nations observer unit between Iraq and Kuwait and the withdrawal of foreign military forces from the gulf region. The resolution also directed Iraq to destroy all its chemical and biological weapons and other weapon of mass destruction and respect the inviolability of the international boundary set out in an Iraqi-Kuwait accord signed by the two countries in 1963. The resolution also imposed an indefinite arms embargo on Iraq and demanded that Iraq compensate for the damage caused by its invasion of Kuwait.

On the boundary issue, Ambassador Li said that China always holds that Iraq and Kuwait should settle the question through negotiations and consultations and respect the agreement on the boundary question reached by the two countries in 1963. Li said that China, in favor of destroying the Iraqi chemical and biological weapons, maintains that a "balanced and comprehensive principle" should be pursued in the arms control in the Middle East and supported the establishment of a zone free from weapons of mass destruction in the region. Li also said that although victims of Kuwait and other countries are entitled to get compensation from Iraq, in actual practice, considerations should be given to the requirements of the Iraqi people's humanitarian needs and to Iraq's payment capability and its needs of economic reconstruction.

In May 1991, the United Nations Secretary-General appointed China as a member of the 21-nation special commission to verify Iraq's destruction of certain weapons as provided for by Security Council Resolution 687 (the Chinese representative was Yuan Renfeng, a physicist). The commission's charter was to carry out an immediate on-site inspection of Iraq's biological, chemical and missile capabilities as the first step for implementing Resolution

687, which sets the terms for a formal Persian Gulf cease-fire. Under the Resolution, Iraq should unconditionally accept the destruction, removal or rendering harmless, under international supervision, all chemical and biological weapons and all ballistic missiles with a range greater than 150 kilometers. China's acknowledgment of participating in these actions did not include any references to the "five principles of peaceful coexistence."

8. China's Nuclear Weapons Testing Program:

China itself has endured a substantial amount of international criticism over its nuclear weapons testing program. Despite a voluntary moratorium on nuclear testing the United States, Russia, Great Britain and France adopted in 1992, China has continued to conduct underground nuclear explosions, partially because it considers the development and testing of its nuclear weapons assets as more important than international efforts to ban nuclear testing.

China detonated its most recent nuclear device on 15 May 1995 at the Lop Nur Nuclear Test Center, Xinjiang Province. The test, the first of five China is expected to conduct before the end of 1996, was the third test in a year, following explosions in October and June.

China's May 1995 explosion occurred just days after the United Nations extended the Nuclear Non-Proliferation Treaty (NPT). The 178 signatories to the NPT agreed to recognize only five "legitimate" nuclear powers: China, the United States, Russia, Britain and France. In exchange, the five agreed to work toward total nuclear disarmament, including completion of a comprehensive nuclear test ban treaty in 1996. Responding to international criticism on China's continuing nuclear testing, a Foreign Ministry spokesperson stated that China would stop nuclear testing once the test ban treaty goes into effect.

The United States, the former Soviet Union and Britain agreed on a partial test ban in 1963 covering atmospheric, space and underwater testing. Underground tests were not covered in that treaty, and China and France did not sign it. China claims its resistance to a partial test ban treaty stems from past threats of nuclear attacks: by the United States during the 1950-1953 Korean War and by the Soviet Union in 1972.

Prior to its 15 May detonation, China issued its first national declaration on the use of nuclear weapons, joining a United Nations initiative to enhance global security. On 5 April, the New China News Agency characterized the five-point document as emphasizing China's "no-first-use policy" and committing China to "aid non-nuclear states under nuclear attack through the United Nations' Security Council."

The New China News reported that the declaration helped China join Russia, France, Britain and the United States in adopting an international resolution clarifying the conditions under which they would use or refrain from using their nuclear arsenals. The China declaration fulfilled an agreement in 1994 by the five permanent council members to provide national declarations defining how each would respond to threats of nuclear attack.

Although the Foreign Ministry claims China intends to sign the Comprehensive Test Ban Treaty, it has been more actively managing the public relations dama_ ‌ ‌used by its refusal to stop nuclear testing and abide by the self-imposed moratorium the other powers instituted in 1992. The United States has led the international protest against China's nuclear policy, with Japan, South Korea and Australia also participating.

9. China's Statements on Chemical Weapons:

China's perception of international chemical weapons treaty initiatives include developing and instituting its own strategic policy as well as having special units of the People's Liberation Army participate in disarmament programs sponsored by the United Nations.

Policy Initiatives: On 22 August 1986, Ambassador Fan Guoxiang, head of China's delegation to the 40-nation Geneva Conference on Disarmament, expressed his concern that the conference progress has "fallen far short of expectations." On chemical weapons, Fan said the United Nations should not overlook the fact that "a large amount of work still needs to be done in negotiating a convention on the prohibition of chemical weapons, in view of the differences on ways of verifying that countries are complying with a ban."

By 1992, China had begun to portray itself as a defenseless victim of chemical warfare. On 21 August 1992, Ambassador Hou Zhitong, Head of the Chinese delegation at the ad hoc committee on Chemical Weapons of the

Conference on Disarmament, said that "as a non-chemical weapon state and a victim of the scourge of foreign chemical weapons, China has always stood firmly for the early conclusion of a chemical weapons convention so as to realize a chemical weapon-free world as soon as possible."

Hou continued by saying that China has always favored a chemical warfare convention by actively participating and contributing to negotiations on the convention. He also stated that the draft text of the convention, dated 19 August, had more positive aspects than the previous one. Hou said China was particularly pleased that the draft stated the fundamental objective of the convention is the "complete prohibition and thorough destruction of all chemical weapons."

Concerns about the Chemical Weapons Convention: However, Hou also voiced several of China's "concerns and reservations" with the convention.

First, Hou claimed that the scope of verification of the chemical industry is too broad. He pointed out that "an extremely large number of chemical facilities not relevant to chemical warfare are subject, where there is no necessity at all, to declaration and verification." He termed the intended inclusion of facilities for space chemistry is totally unreasonable, explaining that 'this will inevitably create grave difficulties for and interference in the chemical industry of the developing countries and adversely affect the effective verification of the chemical facilities truly relevant to the convention."

Second, Hou criticized the draft proposal for unduly emphasizing "challenge inspection," which he claimed is an intrusive and short-notice option that "ignores the danger of abuse and the necessity to prevent abuse of the right to request such inspection." This concern fully accords with China's traditional view on national security rights and sovereignty.

Third, Hou characterized the draft proposals provisions on the extension of the chemical weapons destruction period, the order of destruction and permission to convert some chemical weapons production facilities as not serving the basic objective of the convention and as being detrimental to the security of non-chemical warfare nations.

Fourth, Hou pointed out that the proposal "lacked balance" in its proposals on economic and technological development. He concluded that China, like many other countries, would feel greatly concerned that these drawbacks would adversely affect the "universality and effectiveness" of the convention and be detrimental to international peace and security.

Hou concluded by saying that China, with many other developing countries, has provided constructive proposals and requested negotiations be continued "to iron out differences and remove the grave drawbacks in this draft."

Signing of the Chemical Weapons Convention: On 13 January 1993--less than six months later--Chinese Foreign Minister, Qian Qichen, signed the "Convention on the Prohibition of Chemical Weapons" in Paris. At the signing, Qian is reported as having "reiterated China's consistent stand on the complete prohibition and thorough destruction of chemical weapons at an early date". Discussing the provisions of the convention, Qian commented that the convention had drawbacks, especially concerning verification, which China hopes can be "remedied, overcome and avoided during the course of practice."

Military Participation: In addition to developing and instituting its strategic policy on chemical warfare, China has also established special anti-chemical units of its armed forces the People's Liberation Army to committed them to chemical disarmament programs sponsored by the United Nations.

As early as 1 August 1986--the 59th Anniversary of the founding of the Chinese Red Army--China confirmed that it had an Anti-Chemical Warfare Corps, composed of "specialized technicians." Moreover, China revealed that this specialized corps had become an indispensable component of its combined warfare capability, having a "world-class" protective capacity against nuclear and chemical weapons.

The Anti-Chemical Warfare Department of the General Staff Department said China had developed its Anti-Chemical Warfare Corps solely to defend against nuclear and chemical attacks. China claimed the composite forces "have a protective capability for combat in conditions of nuclear or chemical weapons, and the specialized forces have a certain degree of anti-chemical warfare protective capability." The Anti-Chemical Warfare

Department said all of China's armed units have basic protective capabilities "based on mass protection"; protection by specialized units serve as the backbone element.

On training, the Anti-Chemical Warfare Department revealed that "large numbers" of "anti-chemical warfare specialized cadres and constructive talented people" have been trained and dispatched to the units. Moreover, the anti-chemical warfare schools have trained more than 14,000 specialized troops, now scattered throughout the armed forces and many of whom have become senior commanders and high-level scientific researchers.

China claims it has achieved significant successes in anti-chemical warfare scientific research. It claimed all People's Liberation Army units have a complete set of modern anti-chemical warfare equipment, which is all made in China. China claimed its anti-chemical warfare research departments achieved 277 scientific and technical research results during the sixth five-year plan, 40 of which won state and all-army awards.

The Chinese also made other interesting claims concerning their use of specialized anti-chemical units. The Chinese claimed its anti-chemical corps has used its technology and equipment to augment rescue and relief work and to aid in national construction. The Anti-Chemical Warfare Department specifically cited the great earthquake at Tangshan on 28 July 1976, when the Anti-Chemical Warfare Corps dispatched 68 decontamination vehicles to support rescue and relief efforts. These detachments reportedly cleaned up over 700 tons of toxic materials and contributed to the prevention of a mass epidemic after the disaster. In addition to Tangshan, which claimed as many as 800,000 casualties, the Anti-Chemical Warfare Corps reportedly responded many times to radiation accidents and chemical industry leaks and spills to protect the health and safety of the Chinese citizens.

On 2 March 1992, the People's Liberation Army Anti-Chemical Corps announced at a news conference that China earned the highest verification rate in conducting international comparative chemical weapons tests. China used the new conference to characterized its proficiency as outstanding: "[our] verification rate was the highest, precision rate was the best, analysis method was the most perfect and result was the finest." The results of the first two rounds of the international joint tests reportedly indicated that

China's technology for inspecting and verifying chemical weapons cuts has "already joined the world's advanced list."

China's actions were important to the United Nations initiatives on chemical weapons prohibitions. The Chinese pointed out that after the United Nations concludes an international treaty on chemical weapons reductions, verification of chemical weapons cuts would become an important way to supervise the implementation of the treaty. To have effective inspection and verification, it is necessary to have a standard inspection and verification procedure and method, and to choose some countries with a corresponding ability to establish international laboratories for inspection and verification of chemical weapons reductions. The Chinese claimed that to support the discussions on the chemical weapons treaty, Chinese army's Anti-Chemical Command and Engineering Institute accepted a United Nations invitation to participate in international joint tests.

Specifically, the international joint test involved a mock inspection of a chemical factory in a foreign country. It involved sampling active carbon from the production line and the protective masks used by workers. The participating nations independently analyzed the samples over a 30-day period without background knowledge of the samples. The Anti-Chemical Command and Engineering Institute reportedly organized its teaching staff and scientific research personnel to attain the highest results.

China's precision reportedly outpaced the other 14 nations the United Nations incorporated into the test, including the United States, France, Britain, Germany, the Soviet Union, the Netherlands, Switzerland, Norway, Finland, Czechoslovakia, Canada, Australia and India.

In August 1991, China tasked the Anti-Chemical Command and Engineering Institute to participate in a mock inspection of a military installation in a foreign country, involving samples of rubber, concrete and paint. China reportedly again produced the most reliable results.

A *People's Daily* article on 5 June 92 claimed "China has made great strides in supporting United Nations' initiatives to curb the spread of chemical weapons." In describing China's performance in the chemical detection competition, the article noted that "the People's Liberation Army's General Staff Headquarters Anti-Chemical Weapons Department in Beijing

commended 22 teaching and research personnel for their contributions to comparative tests in a United Nations international chemical disarmament laboratory."

10. Statements on Biological Weapons:

China's participation in biological warfare prohibition discussions began in earnest in 1984. In September 1984, the Standing Committee of China's National People's Congress approved a proposal from Zhao Ziyang for China to enter the Convention Prohibiting the Development, Production and Stockpiling of Biological Weapons, which was signed in April 1972 in Washington, London and Moscow. In announcing the decision, a Foreign Ministry spokesman said China had never produced or possessed biological weapons, but wanted to join with other countries to discourage germ warfare.

Concerns about the Prohibition on Biological Weapons: On 15 September 1984, Vice-Foreign Minister Qian Qichen outlined three shortcomings of the international convention on bacteriological weapons: it "only prohibits development, production and stockpiling" without citing "prohibiting use"; it only calls for destroying related weapons, without mentioning the destruction of the manufacturing plants and equipment for making those weapons; and it has shortcomings regarding supervision and inspection, and violation notification procedures.

Qian, however, concluded by saying that these shortcomings did not affect China's entry into the convention. He reiterated that China has never developed any biological weapons, and does not plan to do so. He also stated that China is opposed to the development and use of biological weapons, and hopes after signing the convention to coordination with other developing countries to oppose violation of the convention and further improve it.

Signing of the Prohibition on Biological Weapons: On 15 November 1984 China signed the Convention on the Prohibition of Development, Production and Stockpiling of Bacteriological (Biological) and Toxic Weapons. The convention, which Britain originally sponsored in a 1969 draft document, strengthens the 1925 Geneva Protocol prohibiting the use of chemical and bacteriological weapons. The United Nations General Assembly approved the treaty in 1971 and opened it for signature on 10 April 1972.

On 10 September 1986, Fan Guoxiang, a Chinese representative to the convention on the prohibition of biological weapons, stated that the convention should be observed and further strengthened. Speaking at the Second Conference to Review the Convention Banning Biological Weapons, Fan said the convention should also facilitate the early conclusion of a convention banning chemical weapons. Describing biological weapons as "extremely cruel and inhuman," Fan said their prohibition conforms to the general desires and interests of the people throughout the world.

Fan also cited China's recommendations that all nations work through international consultation to resolve the remaining shortcomings of the pact, such as developing effective monitoring and verification measures in exercising the convention. He also reiterated China's view that it "attaches great importance to the use of biotechnology for peaceful purposes and for solving problems relating to medicine, health and economic construction."

By 1991, the issue of "biotechnology for peaceful purposes" had taken on greater significance for the Chinese. On 12 September 1991, Hou Zhitong, China's Ambassador for Disarmament Affairs, addressed an international conference on the review of the implementation of the 1972 Biological Weapons Convention by saying that China strongly supported the ban opposed the proliferation of biological warfare technology.

Although Hou declared China would stick to the policy of "no development, no production and no stockpiling of biological weapons" and had "seriously and comprehensively fulfilled its obligations to the convention, submitting annual reports to the United Nations containing information and materials related to the convention," he also stressed that biotechnology had its positive uses which should be encouraged. Specifically, Hou argued "it is China's consistent position to oppose the proliferation of biological weapons, but at the same time, [China] does not agree to any action aimed at restricting or hindering international cooperation and exchange in the peaceful uses of biotechnology."

Hou's presentation included several other minor recommendations. He called on developed countries possessing advanced biotechnology to adopt positive measures to promote trade and technological transfer to developing countries. He proposed measures to further strengthen the authority and

effectiveness of the biological weapons convention including a drive to attract more signatories. He also recommended the United Nations reinforce "confidence-building measures" and conduct in-depth studies to gradually resolve the issue of verification.

On 20 September 1994, Hou, leading the Chinese delegation to a special conference of the states parties to the Convention on the Prohibition of Biological Weapons, claimed that China is devoted to strengthening the "universality and effectiveness" of the Biological Weapons Convention and is in favor of adopting appropriate measures to achieve this purpose. He noted that China has submitted every year to the United Nations its report on the data and information in connection with the convention. He emphasized that the implementation of any international treaty should not be selective, saying that "full implementation of the relevant articles of the convention on the strengthening of international cooperation and exchange in peaceful uses of biotechnology would be helpful to the economic and social development of all states parties and beneficial as well for the enhancement of the universality and authority of the convention." Therefore, Hou said, "sufficient attention should be attached to this issue so as to meet the legitimate concerns and requests from numerous states parties."

11. Disarmament Talks:

The United Nations Conference on Disarmament, which drafts treaties on special weapons prohibition, is only one forum China has joined to discuss arms control limitations. China has also engaged the United States in bilateral discussions on arms control and special weapons prohibition. However, China's bilateral deliberations have been highly volatile and impacted by the general state of Sino-American relations, a relationship which has deteriorated significantly over the past several years.

Generally, all United Nations-sponsored conventions enter into force and become recognized international law when 65 countries have ratified it and deposited the signed and ratified documents with the Office of the United Nations Secretary General in New York. Generally, conventions do not fulfill their promise of eliminating special weapons programs worldwide because no all countries are required to join the convention. For example, Syria and North Korea, two suspected special weapons developers who have close relations with China, have not joined the United Nations' special

weapons conventions. Furthermore, United Nations treaty's verification procedures are highly intrusive and remain ineffective against nations determined to mislead inspectors. Therefore, China is more likely to remain engaged in discussions of disarmament with the United Nations than with bilateral deliberations.

In July 1995, China commemorated the 50th Anniversary of its victory in the Japanese War of Resistance, saying that maintaining a strong defense in "turbulent" times was essential for state security. According to diplomatic sources, "turbulence" referred to the "rock-bottom status" of relations with the United States over the standing of Taiwan, which China still regards as a renegade province. The United States permitted Taiwan President Lee Tung-hui to visit the United States last month, provoking sharp criticism from China. In addition to recalling its ambassador in the United States, China also canceled Minister of Defense Chi Haotian's scheduled visit to Washington and suspended all talks on arms control, canceling a planned visit by Arms Control and Disarmament Agency Director John Holum.

Earlier, on 28 May 1995, the New China News Agency reported that the Chinese government had decided to postpone Sino-US expert consultations on "Missile Technology Control Regime" (MTCR) and nuclear energy cooperation. Foreign Ministry spokesman Shen Guofang announced that the United States government's announcement to allow Lee Teng-hui to visit the United States had "infringed upon China's sovereignty, violated the principles of the three Sino-US Joint communiqués and brought serious damage to Sino-US relations." The article noted that the Chinese government decided to postpone Sino-American consultations on MTCR and nuclear cooperation as well as visits to China by the Director of the United States Arms Control and Disarmament Agency in June and the Deputy Assistant Secretary of State for Political, Military Affairs in July.

China's postponement of scheduled disarmament and arms transfer discussions came in the wake of improving relations in the national defense arena. In October 1994, disarmament discussions coincided with Defense Secretary William Perry's four-day visit to China, which took place despite a standoff with Iraq in the Middle East. Secretary Perry's visit came about a year after the United States lifted a ban on high-level military exchanges with China, in effect since Chinese troops crushed pro-democracy protests in Tiananmen Square in 1989.

Since 1993, Beijing and Washington have agreed to include the Chinese People's Liberation Army in international peacekeeping and disaster-relief operations and have exchanged visits by senior military officers. In August 1994, People's Liberation Army Deputy Chief of Staff General Xu Huizi became the most senior Chinese officer to visit Washington since 1989. In September, General Merrill McPeak, Chief of Staff of the United States Air Force, held talks in Beijing with China's military chiefs. In addition, China and the United States established a Joint Commission on Defense Conversion to discuss transforming their military industries into civilian production.

The United States had imposed missile sanctions on China in August 1993 when relations between the two countries were deteriorating and when China was charged with exporting missiles, chemical weapons, and other dangerous weapons. Primary among these were allegations that China had sent Pakistan parts and technology to assemble the M-11 missiles in violation of the Global Missile Technology Control Regime. Under this pact, formalized in 1987 by Western industrial nations as well as Japan and now including 25 countries, sales of such missiles bar the transfer of certain equipment and related technology. Although China has not signed the agreement, it promised in 1992 that it would honor the agreement.

The United States lifted its sanctions on selling satellite components such as rocket systems, computers and flight control equipment in exchange for a Chinese pledge not to export the M-11 surface-to-surface missile, which can carry nuclear warheads and a 1,000-pound payload 185 miles.

Earlier, in August 1994, Secretary Perry met with General Xu to discuss the bilateral military relationship. These ties, including arms sales, were cut after Chinese troops allegedly opened fire on student demonstrators in Beijing's Tiananmen square in June 1989. General Xu was Army Deputy Chief of Staff in 1989 and likely participated in the operation.

Following Secretary Perry's visit to Beijing, China and the United States held their first round of regular talks on disarmament and arms control since 1988, the sixth round of Sino-American consultations since 1984. The New China News Agency reported no details of the discussions between

Chinese Vice Foreign Minister Liu Huaqiu and the visiting Director of the United States Arms Control and Disarmament Agency, John Holum.

The timing of the resumption of the discussions coincided with China's second nuclear test blast in four months.

THE CHINESE PERCEPTION OF CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 4:

MILITARY INVOLVEMENT

OVERVIEW. Nothing is published in open sources to suggest that China has an offensive chemical and biological component to its military doctrine. However, the People's Liberation Army trains to operate in a contaminated environment and its commanders know about chemical and biological threats and how to employ their units effectively under these conditions. China's defensive chemical and biological training is extensive and includes night exercises, contingency operations and "real world" civil relief operations.

1. Chemical Weapons:

Definition: The Chinese view chemical weapons as containing chemical substances, termed military toxicants (toxicants, for short), that are used in warfare to poison people and animals. The Chinese group various kinds of artillery shells, bombs, rocket shells, missiles, poison smoke containers, hand grenades, land mines and sprayers that contain such substances collectively as "chemical weapons."

Combat Forms of Chemical Toxicants: After chemical weapons are employed, the form in which toxicants cause casualties is termed the "combat form." The combat forms of toxicants are vapor, mist, smoke, liquid droplet and powder form. Mist and smoke forms are collectively termed aerosols.

> *Vapor form:* toxicants are vaporized to become gas molecules that spread in the air.
>
> *Mist form:* toxicants are dispersed to become liquid particles suspended in the air.
>
> *Smoke form:* toxicants are dispersed to become solid particles suspended in the air.

Liquid droplet form: toxicants are dispersed to become liquid scattered on the ground and on objects.

Powder form: toxicants are powdered and sprayed on the ground or let loose in the area.

Some toxicants have a single combat form while others have several simultaneous combat forms, in which a single form predominates. The Chinese collectively term toxic cloud masses produced by explosions of toxic bombs or the toxic cloud masses formed by sprayers as "primary cloud masses." The toxic cloud masses that vaporize from contaminated ground or objects are collectively termed "secondary cloud masses." Both kinds of cloud masses can toxify the air over an appreciable area.

Types of Chemical Toxic Agents - Classified by Toxic Effect: Although there are several ways to classify chemical agents, the Chinese generally organize them by toxic effect. This approach generally conforms to that of the West, except that the Chinese view Adamsite (DM) as an irritant/riot control agent; it is usually categorized in the West as a "vomiting agent." The Chinese also have other minor differences in terminology for chemical agents; for example, they generally refer to "blood agents" as "systemic agents" (see chapter 8 for the Chinese classification scheme of the primary chemical and biological warfare agents). The following definitions reflect the Chinese view of the chemical agents, classified by toxic effect into six major categories.

Nerve: toxicants that damage the normal functioning of the nervous system. Also termed phosphorous-containing toxicants. The main kinds are Sarin, Soman and VX.

Vesicant: toxicants that cause cell necrosis and the ulceration of tissue. The main kinds are mustard gas and lewisite.

Systemic (whole-body poisoning): toxicants that destroy the oxidizing function of cell tissue causing toxification of the whole body through lack of oxygen. The main kind is hydrocyanic acid. These are also referred to as "blood agents."

Incapacitants: toxicants that interfere with human thinking and mobile functions, rendering people temporarily unable to flight. The main kind Is BZ.

Asphyxiating: toxicants that damage the lungs and cause asphyxiation through lack of oxygen. The main kind is phosgene.

Tearing: toxicants that directly irritate the eyes, upper respiratory tract and the skin. The main kinds are CS, CN and Adamsite.

In addition, the Chinese also cite the United States Army as having used large quantities of herbicides (weed killers) such as agents orange, white and blue; Monuron; and Bromacil as chemical warfare agents.

Classification by Tactical Use: In addition to classifying chemical agents by toxic effect, the Chinese also classify them in terms of tactical use. In this approach, chemical agents can be categorized in terms of degree of lethality, speed of effectiveness and relative duration.

a. Degree of Lethality:

1.) Lethal: The Chinese view lethal of toxicants as highly deadly, similar to Western standards. They perceive them as used mostly to kill or wound an enemy's effectiveness and to weaken combat effectiveness. Lethal toxicants include Sarin, Soman, hydrocyanic acid and phosgene. Absorption of highly concentrated nerve or systemic toxicants in the form of vapor or aerosol induces death within one minute.

The Chinese subdivide lethal toxicants into quick killing agents and slow-poisoning agents. The former are toxicants that produce symptoms and lead to death very rapidly after exposure; these include Sarin, Soman and hydrocyanic acid. The latter are toxicants that require a period of incubation after exposure before producing symptoms and death.

2.) Non-lethal: Non-lethal toxicants usually do not kill personnel unless they are subjected to extremely high concentrations; however, they can incapacitate the body or nervous system and cause a rapid but temporary lowering of ability to fight. This category includes Adamsite, BZ and mustard gas. Although these toxicants do not produce death, their

rapid or sustained effect can quickly impair an adversary's movements, thereby giving the user the upper hand.

b. Speed of effectiveness:

1.) Quick-Acting: Quick-acting toxicants produce toxic symptoms very rapidly and either kill or cause a temporary loss of an adversary's ability to fight. They include Sarin, VX, hydrocyanic acid, chloroacetophenone and BZ. Within several seconds following ingestion of large quantities of hydrocyanic acid, apprehension and vertigo set in; within one-half hour, loss of consciousness ensues. Breathing stops within one hour. When personnel are attacked with a quick-acting irritant, the irritation becomes unbearable within one or two minutes. The Chinese view the use of quick-acting irritants in a surprise attack on strongpoints, tanks and armored personnel carriers as fairly effective.

2.) Delayed-Action: Delayed -action toxicants require one to several hours is usually needed for toxic symptoms to appear; an enemy's fighting ability is impaired only after this incubation period. Such toxicants include mustard gas, lewisite and phosgene.

c. Relative Duration:

1.) Non-persistent (temporary): Non-persistent toxicants usually form a gas, a mist or smoke. Their duration of effectiveness is short, lasting only from several minutes to one-half hour. They include Sarin and hydrocyanic acid, in addition to BZ, chloroacetophenone, Adamsite and CS in smoke form.

2.) Persistent: Persistent toxicants usually form droplets or become powder. They are used mostly to contaminate the ground, objects or water supplies. Some may be used to produce a fog to contaminate the air. They are effective for a sustained period of time in causing casualties, usually persisting from several hours to several days. The primary types are Soman, VX, mustard gas and lewisite.

The Chinese inform their field commanders that toxicants that are effective in causing casualties for a sustained period of time are affected not only by the nature of the toxicant itself but also by the temperature and the

method employed at the time of use. For example, when Sarin is used at high temperature, it has a short period of efficacy; when temperature is low, it persists for a long time. As another example, when mustard gas is used in the form of droplets, it persists for a long time; when used as a mist, it has a short duration. Similarly irritants such as chloroacetophenone and Adamsite are usually used as temporary toxicants; but when spread on the ground in powered form, they contaminate the surface and the air for longer periods of time, thus becoming persisting toxicants.

Combat Performance: The table at the end of this chapter summarizes a Chinese field commander's basic knowledge about the combat capabilities of toxic chemical agents categorized by toxic effect.

Nature of Injuries Inflicted by Toxic Agents: The Chinese view chemical agents as providing the user the means to cause widespread casualties, augment the threat of conventional weapons and lengthen the duration of effectiveness.

a. Widespread Casualties: While toxicants can contaminate the air and the ground over a fairly wide area, the wind may spread this contamination considerably. The Chinese believe that the casualty area for chemical munitions ranges from several times to more than ten times greater than that of fragmentation shells. Furthermore, a chemical attack causes casualties not only among personnel lacking protection in the area and downwind from it, but it also penetrates sealed defenses to cause casualties in shelters.

b. Augmenting the Threat of Conventional Weapons: Conventional weapons use primarily bullets and shrapnel to kill or injury personnel directly, while chemical weapons can contaminate the air, ground, objects, water supply and food. When personnel breathe contaminated air, when their skin, raucous membranes (or wounds) come in contact with toxic droplets, or when they unwittingly ingest contaminated water or food, they can be poisoned and injured. Therefore, chemical weapons augment conventional arms and provide the user additional ancillary benefits.

c. Lengthening the Duration of Effectiveness: Conventional weapons kill and wound only during the instant in which they explode, while the killing and wounding effects of chemical weapons persists for a long time. For example, following the explosion of a Sarin munition, the contaminated air

can remain from several minutes to several hours. After the ground and objects have been contaminated with VX, its killing and injuring effect may endure from several days to several weeks.

Purposes of Chemical Attack: The Chinese view users of chemical warfare munitions as having purposes: to inflict casualties, to delay offensive operations and to harass the opposition.

a. Chemical Attacks to Inflict Casualties: Chemical attacks are usually carried out by surprise in a sudden, concentrated and in-force attack on a target (or area) in a lethal or semi-lethal density. The Chinese refer to the former-Soviet Army's training to carry out a chemical attack against a well equipped and well trained force by noting that it usually launched a sudden, massive and concentrated attack within a short period of time (lasting from 15 seconds to one minute) using quick-acting lethal toxicants to eliminate fifty percent or more of the fighting force. When these units trained to launch a chemical attack to kill and wound personnel who lack protective equipment or training, they usually fired quick-acting toxicant shells intermittently so that the density of air contamination is not high but remains effective over a longer period of time.

b. Delaying Chemical Attack: In the Chinese view, delaying chemical attacks impede the movements of an opponent; generally, forces use persistent toxicants to create a contamination that restricts an opponent's movements. To delay the opponent's military activities, attacks are made against an opponent's reserves, which weakens unit effectiveness (such as rendering twenty percent of personnel unable to fight). In addition, users typically target roadways to hinder enemy force employment; such targeting impedes an opponent's vehicles and artillery by contaminating usable territory, restricting the use of equipment and terrain. To do this, the former-Soviet army recommended an attack of long duration, the first attack completed within three-to-five minutes. After the contamination, a supplementary attack is launched depending on meteorology and topography to maintain a certain density of contamination and produce a persistent contamination.

c. Harassing Chemical Attack: The Chinese view an harassing chemical attack as an effort to disturb an opponent's combat movements and exhaust his troops. Usually a small amount of quick-acting toxicant is used in

intermittent chemical attacks, forcing an opponent to wear protective equipment for long periods of time to exhaust combat effectiveness. The Chinese warn their field commanders that when the former-Soviet army fired regular shells, it simultaneously fired a small number of quick-reacting toxic shells to threaten the opponent psychologically and weaken their will to fight; in many cases unprotected personnel will leave their defenses to attack or retreat, facilitating their targeting for conventional firepower.

Effects of Meteorology and Terrain on Use of Chemical Weapons:

a. Effects of Meteorology: The Chinese emphasize the impact of four meteorological variables on the effectiveness of chemical warfare agents.

1.) Wind: Wind direction determines the route in which a toxic cloud mass spreads. Usually, when an enemy units use a favorable wind direction (a following wind or a lateral wind) to launch toxicants, they use temporary type toxicants when the target is nearby or when the wind direction is unstable; accordingly, they usually have friendly forces wear gas masks. The Chinese inform their field commanders that wind speed affects the density of air contamination; a speed of one to four meters per second is favorable for maintenance of an injurious density. However, when the wind speed is high, the contaminated air spreads rapidly and its density declines swiftly; therefore, the depth to which it causes injuries is short. When wind speed is greater than six meters per second, it is difficult to sustain an injurious density.

2.) Atmospheric Temperature: When the temperature is high, liquid toxicants evaporate rapidly, causing a high density of contamination and increasing toxic effectiveness. However, toxicants in droplet form do persist. When the temperature is low, liquid toxicants evaporate slowly, causing a low density of contamination and weakening toxic effectiveness. Depending on atmospheric temperature, some toxicants may even congeal, becoming unable to cause casualties.

3.) Vertical Stability of the Atmosphere: The vertical stability of the atmosphere refers to the extent to which the air flows vertically, thereby directly influencing the effectiveness of chemical weapons. The Chinese cite three principal conditions:

a.) Convection: Under this condition, the higher the elevation, the lower the temperature. At higher altitudes, there is a dramatic vertical movement of the air, causing contaminated air to spread rapidly and diminishing its density. The result is a shorter period of effectiveness and a reduction on the affected area. This condition does not favor the use of chemical weapons.

b.) Inversion: Under this condition, the higher the elevation, the higher the temperature. Under these circumstances, there is virtually no vertical air motion, and contaminated air cannot easily spread upward. Instead, it remains near the ground and maintains a density that causes casualties for a long period of time. The affected area is large. This is a favorable condition for the use of chemical weapons. Inversions usually occur on clear days (when the wind speed is less than four meters per second). Between twilight and dawn inversions are most intense; inversions generally deteriorate after sunrise.

c.) Isotherm: This is an atmospheric condition between convection and inversion. It provides fair conditions for the use of chemical weapons. This condition usually occurs at dawn, toward evening and on overcast days.

For the above reasons, the Chinese view an enemy as likely to use chemical weapons during inversion or in isotherm conditions; these conditions generally exist toward evening, during the night, at dawn, or on overcast days.

4.) Precipitation (Rain or Snow): Heavy rain or continuous light rain can scatter airborne toxicants and wash away toxicant droplets on the ground or objects. Dilution of certain toxicants renders them ineffective. Some toxicants may flow into low-lying areas or into creeks or rivers where they pose a long-term contamination danger. Heavy or medium-heavy snows may temporarily cover contaminated ground; snow is not a barrier against toxicants until it is twenty centimeters or more deep.

b. Effects of Terrain: Terrain mostly affects the spread of toxic cloud masses and its dispersal speed. When toxic cloud masses encounter high ground in the process of spreading, the contaminated air flows over both sides of the top of the high ground and halts temporarily in areas of little or no

wind. When they encounter long stretches of mountains, the contaminated air changes direction to follow the course of the mountain; typically, they spread along mountain valleys, causing damage fairly deeply. On open land and water surfaces, toxic clouds move forward smoothly. Although the toxic air spreads rapidly and impacts a wide area, duration which it cause casualties is short and the extent of damage is slight. Toxic gases cannot spread easily in lowland areas, bays, dense forests or residential areas; although the area they affect is small, they persist longer and cause more serious damage.

2. Biological Weapons:

Definition: The Chinese view biological weapons as containing poisons produced by pathogenic organisms (including bacteria, rickettsia, chlamydia and viruses) and as viruses that are used in warfare to injure people and animals and destroy farm crops. The Chinese collectively term the various kinds of bombs, missile warheads, aerosol generators and sprayers that carry biological warfare agents as "biological weapons."

Types of Biological Warfare Agents : One method the Chinese use to classify biological warfare agents is by degree of injury and degree of communicability.

a. Degree of Injury:

1.) Incapacitating agents mostly cause a temporary loss of ability to fight; incapacitating agents include brucella bacillus and Venezuelan equine encephalitis.

2.) Pathogenic warfare agents cause deadly illnesses; the Chinese use a death rate of 10 percent of better as pathogenic. Pathogenic warfare agents include bubonic plague bacillus and yellow fever virus.

b. Degree of Communicability:

1.) Communicable warfare agents spread swiftly, becoming epidemic in a very short period of time and persisting for a substantial period. These agents include plague and smallpox.

2.) Non-communicable warfare agents infect only by contact. Botulin, for example, is used mostly against campaign and tactical targets.

Methods of Releasing Biological Warfare Agents: The Chinese perceive three primary categories of releasing biological warfare agents:

a. Release of Biological Warfare Agent Aerosols: When solid or liquid biological warfare agent particles are suspended in the air, they are termed biological warfare agent aerosols. They use wind currents to contaminate the air; ground; and food and water supplies while retaining the capability to penetrate unprotected defenses. When personnel inhale biological warfare aerosols, they usually become ill. The Chinese warn their field commanders that the release of biological warfare agent aerosols is the principal means enemies use to spread biological warfare agents. There are three principal methods of aerosol release:

1.) Biological Bombs: Biological bombs and missile warheads produce aerosols in the way they explode.

2.) Aerosol Generators: Aerosol generators are usually soundless and releasable by aircraft.

3.) Spray Boxes: Spray boxes may be used for low altitude spraying by aircraft upwind of targets; they may also be used by ships for release at sea to move inland.

b. Dropping of Bacteria-bearing Media: Bacterial-bearing insects and miscellaneous "media" are packed in special containers for airborne release. The specific methods and equipment used are as follows:

1.) Four-Compartment bombs: These resemble regular bombs in appearance and weight, but are divided into four compartments. When used, they split open about 30 meters above ground level to spread insects and other contaminated contents.

2.) Cardboard Tubes with Parachutes: These resemble illumination shells in exterior appearance and are suspended from parachutes. They are used primarily to spread insects.

3.) Thin Shell Devices: The outer shell of these devices is a round, think covering made of calcareous material that is loaded with insects or small animals. When it hits the ground, it breaks open to release the contents.

c. Other Methods: The Chinese warn their field commanders that an enemy may dispatch secret agents to release biological warfare agents to contaminate water supplies, food and ventilation ducts. Also, enemy units may leave behind articles contaminated with germs when retreating or withdrawing from the battlefield.

Role of Biological Weapons in Inflicting Casualties:

a. Routes By Which Biological Warfare Agents Enter the Human Body: The Chinese view biological agents as entering the human body by three main routes. Because the methods of release vary and because of the differences in the nature of biological warfare agents themselves, the paths by which each agent enters the body are not the same.

1.) Inhaling: Air that has been contaminated with biological warfare agents may poison through the respiratory tract.

2.) Accidental Eating (or Drinking): Water and food that has been contaminated with biological warfare agents may poison through the digestive tract.

3.) Skin Contact: Biological warfare agents may poison directly through the skin, mucous membranes or wounds. Insect bites also poison through skin contact.

b. Pathogenic Symptoms of Biological Warfare Agents: Once biological warfare agents have entered the body, they may damage physiological functions and cause death. After most biological warfare agents have caused sickness, fevers, headaches, total body weakness, vomiting, diarrhea, coughing, nausea, breathing difficulty and body aching may appear. The table at the end of this chapter summarizes a Chinese field commander's basic knowledge about the combat capabilities of toxic biological agents.

c. Characteristics of Casualties Inflicted by Biological Warfare Agents:

1.) Strong Pathogenesis and Widespread Contamination:

Biological warfare agent germs are strongly pathogenic. A small amount of germs entering the body can cause sickness or death; a wide area can be easily contaminated. For example, the Chinese note that the spraying of biological warfare agents by a single aircraft can contaminate an area of several hundred or several thousand square kilometers.

2.) Communicable: Some biological warfare agents--such as plague, smallpox, cholera and typhus--are highly communicable. Unless field commanders institute preventive measures immediately following the outbreak of illness, disease will quickly become epidemic.

3.) Harmful Effect of Long Duration: Biological warfare agent aerosols are usually effective for several hours (two hours in daylight and eight hours at night); when conditions are favorable, the duration is longer. For example, the Chinese note that Cholera vibrio that has been discharged into water may live for "scores of days" under certain conditions. Plague bacillus can survive for several weeks in shaded places. Anthrax bacillus germs may survive in soil for several years. Also, some biological warfare agents may survive in the bodies of insects for long periods of time and even be transmitted from one generation to another.

4.) No Immediate Casualties: An incubation period is needed between biological agent entry into the body and the onset of illness. The length of time required depends largely on the type of agent and the dosage. Usually, a minimum of several hours and a maximum of ten to twenty days is needed. During incubation, the contaminated person has no obvious symptoms and maintains an ability to fight.

5.) Markedly Affected by Natural Conditions: Strong sunshine will kill most microbes within several hours, and high winds and convection currents will dissipate aerosols very quickly. Temperature, humidity, rain, snow and topography all affect biological warfare agents.

3. Military Protection against Chemical and Biological Agents:

Overview: Commanders of Chinese People's Liberation Army units follow a dual approach to defend against chemical and biological attack. Commanders are trained to first actively "seek out and destroy" enemy chemical and biological munitions. Second, they institute strict defensive measures against an enemy use of such munitions on allied forces.

a. Active Destruction and Strict Protection: The Chinese view active destruction as the "assembly of effective firepower and the taking of other actions to destroy the enemy's chemical and biological weapons to prevent their use or to weaken capacity to use them." The Chinese define "strict protection" as "well-conceived protective organizations, full protective preparations and effective protective actions to support the free movement and sustained combat effectiveness of the armed forces under conditions when nuclear, chemical or biological weapons are being used."

b. Group Protection: Chinese field commanders use group protection to strengthen support to professional soldiers. The Chinese define "group protection" as "actions which use the initiative and enthusiasm of the entire unit, organizing conscientiously on the basis of the character of units concerned." The main component of group protection is for field commanders to establish protective organizations, intensify protective training and use general methods to specific situations to take efficient protective measures. Support to professional soldiers--primarily the infantry--is the primary purpose of China's chemical defense troops and other specialized personnel (further information is unavailable).

c. Role of Technology: Chinese forces train to use its chemical protective gear for widespread defense. In the Chinese armed forces, various kinds of chemical defense equipment and devices are fundamental to units carrying out protection (see Chapter 5). However, field commanders are trained that in a protracted war, when fighting alone, or in a wartime situation where replenishing chemical defense equipment is not possible, they must rally and rely on the broad masses of people to use rudimentary protective devices and methods to carry out chemical defense.

Major Chemical and Biological Protective Actions: In accordance with the tenets of People's War, Chinese field commanders train to use a variety of field protective measures against chemical and biological weapons.

a. Reconnaissance: Commanders will use various reconnaissance techniques to quickly discover enemy deployments of chemical and biological weapons and to estimate the situation regarding an enemy's preparations and intentions. Essential elements of intelligence information include:

1.) deployment areas
2.) launching positions
3.) control facilities
4,) ammunition dumps
5.) intentions and techniques for use
6.) targets and areas that may be attacked
7.) establishment and obstacles to enemy chemical attacks

b. Amassing Effective Firepower: Commanders are instructed to use massive firepower or other "active techniques" to destroy enemy chemical and biological weapons if they are discovered in combat. Effective firepower should be assembled to try to destroy such munitions before their use or while being transported. If chemical or biological weapons have been used, field commanders should assemble the firepower to destroy them; targets that present the greatest threat to troop units should be destroyed first.

c. Establishment of an Observation and Reporting Network: Field commanders also train to institute a chemical intelligence network to monitor indications of an enemy's use of chemical or biological munitions. Although the Chinese acknowledge they command a variety of communication techniques for timely, accurate and priority dispatch of enemy chemical and biological intelligence information, they do not elaborate on their means and effectiveness. Not only do army and division commanders set up dedicated chemical observation posts, but they also concurrently assign observation posts at all levels the responsibility to detect signs of attack and to monitor the situation closely. When indications or an attack is discovered, the observation posts immediately report to higher authority. Headquarters uses intelligence channels and communications techniques for timely, accurate and priority transmission of reports on chemical and biological warfare use.

d. Use of Terrain and Meteorological Conditions: Use of Camouflage and Dispersal of Deployments to Conceal Movements: Commanders are trained to use terrain, weather and camouflage to conceal movements and preserve military strength. The Chinese note that military units--whether attacking or defending, whether at the front or in rear areas--must use all kinds of camouflage measures to avoid or reduce losses from enemy chemical weapons. To shield unit dispersal from enemy intelligence, the Chinese train to electronically jam enemy communications, set up phony targets, issue false intelligence and feign movements. They also train to deny the enemy combat information by forming strict security measures and cutting off information to hide the intentions of military unit movements.

e. Construction of Protective Fortifications: Chinese field commanders train to build fortifications against chemical and biological attack. To use existing facilities, commanders direct improvements to guard against chemical and biological attacks once the intelligence network identifies such a threat. The inspection, repair and use of chemical and biological defense installations and support for protection within the fortifications becomes the responsibility of persons the commander designates. Commanders train to use lulls in fighting to repair fortifications and installations for defense against chemical and biological attacks so that the fortifications continue to provide protection.

f. The Supply of Chemical Defense Equipment: Commanders train their units to use chemical and biological defense equipment, devices and technical support. These include chemical protective gear available at the unit level. The Chinese military leadership first supplies chemical protective equipment to forces of the main offensive direction and later to secondary directions. They provide protection first to the front and later in-depth, first to meet urgent needs and later to meet less urgent requirements. Field commanders are trained to coordinate a method of sending supplies forward or replenishing them at fixed points. Units of all levels are to maintain a "certain proportion" of field protective gear in reserve. To account for the lack of manufactured equipment and the difficulty of wartime supplying, commanders are instructed to collect functional materials and make every effort made to use captured equipment. Manufactured materials should be kept in good condition and should be inspected, maintained and repaired to raise their rate of utilization.

g. Organization of Mass Medical Prevention and Epidemic Prevention Sterilization: Commanders must also assess its medical support assets so that when an a chemical or biological weapons attack occurs, mass medical and epidemic prevention can be done at once. This is an important task for headquarters and logistical departments; its main components are as follows:

1.) provide preventive inoculations
2.) provided preventive doses of medicine to combat unit personnel
3.) inspect the health and epidemic prevention situation in areas where units are deployed
4.) carry out mass heath and epidemic prevention work to eliminate disease-causing microorganisms and bee conditions
5.) establish epidemic prevention stations and teams to provide guidance on epidemic prevention

When military units are active in a contaminated area, they should take protective actions immediately and follow safety regulations. Military units in contaminated areas should organize rotational rest, rotation of shifts, or evacuation from areas in accordance with instructions from higher authority. Those transiting contaminated areas take defensive measures or detour around the areas as combat circumstances and terrain dictate.

h. Post-attack Operations: Following an enemy chemical or biological weapons attack, the field commander should ascertain the situation and adjust combat deployments to continue the combat mission. Rescue, firefighting and repair of fortifications should be done immediately. Chemical and biological testing and dosage controls should be conducted to determine contamination. Disinfection and decontamination should be done as duties and the contamination situation dictate. Food and potable water that may have been contaminated should be checked and hygienically treated.

Intelligence Indicators and Offensive Measures:

a. Intelligence Indicators: Field commanders rely upon several essential elements of information to help estimate the likelihood of enemy chemical and biological attack. These include seeking enemy indications of specially marked shells or bombs and special containers (such as airplane

sprayers) at warehouses, unloading points, airfields or launch sites deep within the enemy's interior as well as the presence of special vehicles (such as sprinkler vehicles), guarding or convoying, and the issuance to personnel of protection or detection devices. Also included are discovery of assembly points for special purpose explosives. Sudden issuance of protective gear, antidotes to units in enemy front-line positions, carrying of protective gear at work, or a sudden withdrawal or going undercover are other key indicators. Finally, commanders are trained to look for sudden general inoculation and vaccination of personnel in enemy deployment areas though no contagious diseases have occurred and though it is not the season for disease outbreak.

b. Offensive Measures: In accordance with China's emphasis on active defense, field commanders analyze three major factors which impact the decision on a preemptive military action. Such attack usually uses reconnaissance detachments and guerrillas to carry out sabotage raids against rocket-launching vehicles and warehouses deep within enemy territory. Also, field commanders can request China use the air arm in preemptive strikes.

1.) Targets: Commanders are trained to prioritize the destruction of targets that threaten the unit from among enemy chemical and biological weapons launching sites; means of delivery; transportation vehicles; command and control facilities; reserve warehouses; and bases.

2.) Time: Efforts to destroy chemical and biological weapons before an enemy's use or while in the process of use or transportation.

3.) Methods: Methods of destruction depend on the distance from targets as well as the ability of China's forces to effectively attack. Field artillery, antiaircraft artillery, the air force, rockets or missiles may spearhead the effort. Chinese field commanders learn the details of successes in military history. For example, the Chinese acknowledge that the Vietnamese people's armed units shot down nearly 20 aircraft that were spraying toxicants in the Tay Nguyen area in 1969; even when missing their targets, the fire forced enemy aircraft to fly high, thus reducing the effectiveness of the toxicants.

In addition, the Chinese military leadership can dispatch reconnaissance detachments, parachute troops, guerrillas, militia and local armed units behind enemy lines to carry out sabotage. An example was the destruction by Vietnamese peoples armed units in 1968 of warehouses

containing toxicants and a considerable number of large transport aircraft capable to spraying toxicants at Longbinh, Nhabanh, Quinhan and Hiencang. In September of the same year, a warehouse containing toxicants was raided at Trinhminhe Bridge in Hiencang making it impossible for the enemy to use toxicants for the time being. Army and division artillery were frequently used to destroy targets far behind enemy lines.

China's View of the Combat Performance Capabilities of Toxic Chemical Agents:

Category	*Agent*	*Duration of Effectiveness*	*Toxic Effects*	*Combat Form*	*Protection*	*First Aid*	*Disinfection*	*Field ID*
Nerve Agents	Sarin (GB) Tabun (GA) Soman (GD)	from more than 10 minutes to several hours	damages the systems normal functioning, leading to paralysis	gas mist droplets	gas mask and protective clothing	Atropine injection; artificial respiration	disinfection of droplet contamination	droplets seem like fine mist
	VX	several hours in summer; several days in winter	damages the systems normal functioning, leading to paralysis	gas mist droplets	gas mask and protective clothing	Atropine injection; artificial respiration	disinfection of droplet contamination	droplets seem like fine mist
Systemic Agents	Hydrocyanic Acid (AC)	several minutes to more than 10 minutes	acute lack of oxygen and systemic poisoning	gas mist	gas mask	breathing of amyl nitrite	not necessary	colorless
	Cyanogen Chloride (CK)	several minutes to more than 10 minutes	acute lack of oxygen and systemic poisoning	gas mist	gas mask	breathing of amyl nitrite	not necessary	colorless
Respiratory Agents	Phosgene (CG)	several minutes to more than 20 minutes	damages lungs leading to edema, lack of oxygen and asphyxiation	gas	gas mask	avoid activity; keep warm	not necessary	colorless

Category	*Agent*	*Duration of Effectiveness*	*Toxic Effects*	*Combat Form*	*Protection*	*First Aid*	*Disinfection*	*Field ID*
Vesicant Agents	Mustard (H)	several hours to several days	damages cells, causing cell muscle ulceration	mist droplets	gas mask; protective clothing	remove poison droplets	needed	pale yellow, oily droplets
	Lewisite (L)	several hours to several days	damages cells, causing cell muscle ulceration	mist droplets	gas mask protective clothing	remove poison droplets	needed	pale yellow, oily droplets
Incapacitating Agents	BZ	several minutes to more than 10 minutes	damages adrenaline functioning	smoke	gas mask	evacuation	not necessary	gray smoke
Irritant Agents	CN Adamsite (DM)	several minutes in smoke form; between 10 minutes and 10 hours in liquid form	Irritates eyes and respiratory tract	smoke	gas mask	wash with soap and water	not necessary	smoke
	CS	several minutes to more than 10 minutes	Irritates eyes and respiratory tract	powder	gas mask	wash with soap and water	not necessary	smoke

China's View of the Combat Performance Capabilities of Toxic Biological Agents:

Category	*Biological Agent*	*Incubation Period*	*Symptoms*
1. Bacteria (细菌/xijun):			
	鼠疫杆菌 (shuyi ganjun/Bubonic plague bacillus)	1-9 days	swelling of the lymph glands with extreme pain. Chest pain from pneumonic plague with blood sputum and difficulty breathing
	炭疽杆菌 (tanju ganjun/anthrax bacillus)	1-7 days	Fever. Difficulty breathing and chest pain from respiratory anthrax. Red papules, blisters and hard scabs from cutaneous anthrax.
	霍亂弧菌 (huoluan hujun/cholera vibrio)	1-5 days	Nausea. Severe vomiting and diarrhea, dry skin, muscle spasms and prostration
	野兔热杆菌 (yeture ganjun/Tulameria bacillus)	3-10 days	Fever. With glandular type, whole body aches and lymph glands swell. Chest type produces chest pains, bloody sputum and coughing.
	類鼻疽杆菌 (leibi ju/meliodosis bacillus)	4-7 days	Fever. Boils on skin, diarrhea, muscle ulceration and headache.
	馬鼻疽杆菌 (mabiju ganju/Glanders bacillus)	1-14 days	Skin rash, diarrhea, muscle ulceration

Category	Biological Agent	Incubation Period	Symptoms
2. Virus (病毒/bingdu):			
	黄热病病毒 (huangrebing/yellow fever virus)	2-12 days	Fever, nausea and chills. Headache, back and leg pain, nausea with vomiting, jaundice and proneness to nosebleeds.
	东方馬腦炎病毒 (dongfang ma naoyan/Oriental equine encephalitis virus)	5-10 days	Fever, twitching, rigid occipital muscles, numb limbs and swollen face and legs.
	天花病毒 (tianhua/smallpox virus)	7-16 days	Fever. Face and body have pupules which give way to a rash of blisters and pustules that form scabs.
	登革热 (denggere/Dengue fever)	1-10 days	Fever and sometimes chills. Headache, muscle and joint aches. Complete enervation, skin rash and proneness to nosebleeds.
	立夫特山谷热 (lifute shangu re/Rift Valley fever)	1-6 days	Fever, whole body pains, complete fatigue, nausea and vomiting.
	布氏杆菌 (Bu shi ganjun/Brucella bacillus)	6-30 days	Undulant fever. Heavy sweating, wandering arthritis, muscle pain, headache and enlarged liver and spleen.
	痢疾 (liji/dysentery)	n/a	n/a

Category	Biological Agent	Incubation Period	Symptoms
3. Ricketts 立克次體 (likeciti):			
	Q 熱 (Q re/Q fever)	n/a	n/a
	落磯山斑疹傷寒立克次體 (luojishan banzhen shanghan likeciti/Rocky Mountain Fever)	n/a	n/a
4. Coccoid Fungus (衣原體真菌/nongyuanti zhenjun):			
	鸚鵡熱 (yingwu re/psittacosis)	n/a	n/a
5. Fungus (真菌/zhenjun):			
	粗球孢子菌病 (cuqiu baozi junbing/staphylococcus)	1-6 hours	Vomiting and diarrhea, chest pain, headache and complete enervation
6. Toxin (毒素/dusu):			
	肉毒桿菌毒素 (roudu ganjun dusi/botulin bacillus toxin)	1/2-2 days	Vision blurred. Double vision, drooping eyes, nausea, vomiting and complete body lethargy.

THE CHINESE PERCEPTION OF CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 5:

EQUIPMENT

OVERVIEW. Generally, China produces the chemical defense equipment needed to support its basic military requirements; it also exports basic chemical defense equipment through quasi-military organizations, such as the China North Industries Corporation (NORINCO). However, China is less self-sufficient in more advanced chemical defense equipment. For example, they do not export complex equipment or associated components for sophisticated defenses, such as aircrew respiratory systems or collective defense systems.

Concerning equipment specifically supporting biological warfare defense, China is not known to produce or export any systems. However, protective masks and other chemical warfare defense equipment often also yield ancillary benefits in biological defense.

1. Protective Masks:

Type 69 Protective Mask: The China North Industries Corporation (NORINCO) makes and exports many of the chemical protective masks in service with the Chinese People's Liberation Army. The Type 69 Protective Mask is designed to protect the wearer against toxic gases and vapors, smoke, radioactive dusts and bacteria. It consists of a molded rubber facepiece with wide vision eyepieces that are probably flexible. A charcoal-based filter canister is located on the side of a large voice transmission device that projects prominently to the front. Many photographs of the People's Liberation Army pictorial show drivers and crew of self-propelled armored personnel carriers wearing the Type 69 Protective Mask during military exercises. This mask includes a voice transmission device which provides 90 percent articulation to a range of 50 meters.

Protective Mask M-65: In addition to NORINCO, the Xinhua Chemical Factory manufactures two types of protective masks. The M-65, developed by the Research Institute for Chemical Defense, has a distinctive and prominent filter housing on the left-hand cheek of the faceplate and a prominent voicemitter at the front. Large lens eyepieces are provided and the mask is held in position by a six-strap head harness. The filter can withstand aerosols down to .3 micron in diameter. The M-65 is in service with Chinese People's Liberation Army.

Protective Mask M-87: The Xinhua Chemical Factory has also designed and produces the M-87 protective mask. The M-87 appears to have a natural rubber faceplate held in place by a six-strap head harness. A cylindrical filter canister is fitted to the left-hand side of the faceplate and large eye lenses are provided. A prominent voicemitter is fitted to the front of the faceplate. Similar to the M-85, the M-87 can withstand aerosol droplets down to .3 microns. The MF-11 protective mask, a variant of the M-87, includes a drinking device. Both are in production but are not confirmed to yet be in service with the Chinese People's Liberation Army.

Type-64 Protective Mouth Mask: The Type-64 Protective Mouth Mask is part of the protection kit the Chinese People's Liberation Army issues to its combined arms armies and its anti-chemical warfare troops and detachments (the kit also includes anti-phosphorous needles and skin disinfectants). The Type-64 is used mostly against biological aerosols. When a gas mask is not available, the Type-64 can also protect against radiation dust and gases.

According to the Handbook of Military Knowledge for Commanders, China issues Type-64 (in its basic field protection kits), Type-65 and Type-69 masks to its combined arms armies and its anti-chemical warfare troops and detachments. Their function is to protect the respiratory organs, eyes and face from damage caused by toxicants, radiation particles and biological warfare agents. Protection times are listed on the following page:

	Type-64 Protective Mouth Mask	*Type-65 Protective Mask*	*Type-69 Protective Mask*
Cyanogen Chloride	43 minutes	30 minutes	25 minutes
Sarin	10 hours	10 hours	6 or more hours
VX	2 hours	30 minutes	30 minutes

China is not known to export personal filter canisters. However, they are likely self-sufficient in producing charcoal-based filters for military, police and industrial applications.

2. Aircrew Respiratory Systems:

China is not known to produce or export aircrew respiratory systems. As such, they may lack specific respiratory systems to support ground combat operations which use helicopters, transports or patrol aircraft.

3. Protective Clothing:

Protective Suit, Permeable, M-82: The Huajiang Machinery Plant produces the M-82 for service with the Chinese People's Liberation Army. Developed by the Research Institute for Chemical Defense, the outer layer of the M-82 is made of nylon-cotton blend fiber; the inner layer is made of cotton flannel. One surface of the inner layer is finished with an active charcoal-acrylate mixture and the other surface is finished with an oil-repellent agent. The basic suit uses two garments, a fly-fronted jacket with an integral hood, and over-trousers. The suit is completed by butyl rubber gloves and overboots, the latter held in position by laces. The suit is supplied in a camouflaged and waterproof finish. The suit weighs 1.3 kilograms and has a life between 20 and 50 hours with mustard or G-type nerve agents in vapor form, and up to six hours against mustard and nerve agents (both G and V agents) in liquid vapor form. Photographs of the M-82 protective suit show it being worn along with the Protective Mask M-65. The M-82 is in service with Chinese People's Liberation Army.

Protective Suit, Butyl, M-66: Anti-chemical personnel use the M-66 Protective Suit when carrying out decontamination procedures. Developed by the Research Institute for Chemical Defense and manufactured by the Guilin Rubber Products Factory, the M-66 is a one-pieced butyl-based outfit with integral hood and boots. Butyl rubber gloves are worn as accessories. Elasticized closures are provided at the cuffs and around the integral hood, while laces are provided at the ankles and waist. The M-66 Protective Suit weighs 2.3 kilograms and has a life of up to 130 minutes against 20 milligram droplets of HD at 36 degrees centigrade. Photographs of the M-66 Protective Suit also show it being worn along with the Protective Mask M-65.

China is not known to manufacture or export NBC disposable protective clothing, ponchos or capes.

4. *Decontamination Kits and Equipment:*

M-73-1 Decontamination Vehicle: The M-73-1 Decontamination Vehicle is based on the chassis of the CA-30 (6-wheeled) two and one-half ton cargo truck (the CA-30 is a Chinese copy of the Russian ZIL-157). The vehicle carries at the rear a 2.5 cubic meter tank to carry decontaminating agents that are dispensed over large areas of terrain through spray bars at the rear of the vehicle. The rate of dispensing is controlled by two operators seated at the rear of the tank and over the spray bars when the vehicle is operating. For traveling purposes the two operators are seated in an enlarged crew cab behind the driver and vehicle commander. Developed by the Research Institute for Chemical Defense, The M-73-1 has a gross weight of 9300 kilograms. Its length is 6.86 meters; width 2.4 meters; height 2.42 meters. It is in service with the Chinese People's Liberation Army.

M-82 Personnel Shower Vehicle: The M-82 Personnel Shower Vehicle is also based on the chassis of the CA-30 (6-wheeled) two and one-half ton cargo truck with an enclosed box body. When in use for personnel decontamination, the box body slides to the rear where it is supported on folding legs. This allows internal space for disrobing and donning fresh clothing after showering. Extra compartments enclosed by canvas covers are then erected on either side of the rear body. Access to the shower section is via ladders through one of three entrances to the rear and egress is through side exits toward the front of the canvass extensions. Manufactured by the Research Institute for Chemical Defense, the M-82 includes a water pump

and heater, with water supplied to the system through a flexible hose normally carried on the front of the box body. The M-82 is in service with Chinese People's Liberation Army.

Decontaminating Apparatus, Tank, M-84: The portable M-84 tank decontaminating apparatus is a rechargeable cylinder containing 1.5 liters of a decontaminating agent known as T-191. Produced by the Research Institute for Chemical Defense, the M-84 is carried in a variety of vehicles for local first aid decontamination. The M-84 is in service with Chinese People's Liberation Army.

China is not known to have complex decontamination system capabilities, such as semi-trailers; integrated disinfection and detoxification containers; or field laundry capabilities.

5. Chemical and Biological Detection Systems:

Chemical Warfare Agent Identification Kit, M-75: Developed by the Research Institute for Chemical Defense, the M-75 Chemical Warfare Agent Identification Kit was designed for use by special troops to detect all known chemical warfare agents. Contained in a carrying box equipped with a shoulder strap are a small air pump, racks of glass ampoules filled with various reagents and other items including a set of instructions inside a lid that serves as a working tray when opened. In use, the ampoule is placed onto the air pump once one end has been broken off. As air is pumped through the reagent in the ampoule color changes indicate the presence of chemical agents. The kit contains ampoules to detect nerve agents, mustard gas, hydrogen cyanide, cyanogen chloride, phosgene, diphosgene, chloroacetonephenone and Adamsite. The M-75 is manufactured by the Great Wall Instrument Factory in Beijing.

Chemical Warfare Agent Vapor Detector Kit, M-86: The M-86 Chemical Warfare Agent Vapor Detection Kit is used at the sub-unit level to detect the presence of chemical warfare agent vapors and determine if it is safe to remove protective respirators and clothing after a chemical warfare attack. The M-86 uses the puffer principle in which a small reagent ampoule is placed in the puffer/sampler and the puffer is actuated several times. If the reagent changes to certain colors, a chemical warfare agent is present. The exact color change will indicate the type of agent present. The M-86 can

detect nerve agents, mustard gas, hydrogen cyanide and cyanogen chloride. Developed by the Research Institute for Chemical Defense and manufactured by the Great Wall Instrument Factory, the M-86 kit is packed into a flat canvas wallet with velcro closures and contains one puffer/sampler, three or four reagent ampoules, chemical agent detector papers and a set of instructions.

Detector Paper Booklet, Chemical Warfare Agent, Liquid: Developed by the Research Institute for Chemical Defense, these detector papers are issued in booklet form packed into clear plastic envelopes. Each sheet of paper has an adhesive backing. Two types of booklets are produced: Type X-1 is dark blue; Type X-3 is dark red. Exposure of either type paper to nerve or mustard agents will cause the paper to change color.

Chemical Agent Detector Paper, 3-way Liquid, Adhesive-backed: Developed by the Research Institute for Chemical Defense, these detector papers are issued in booklet form packed into clear plastic envelopes. These papers are highly sensitive to droplets of chemical warfare agents; colored stains appear when agents are present. Indicator strips on the inside cover of the booklet can be used to determine the type of agent involved. These adhesive-backed papers are issued in booklets of 10 sheets; each sheet has a protective backing which is removed before use. These papers can detect nerve and mustard agents.

6. Radiation Survey Meters and Detection Equipment; Dosimeters, and Charging Units:

Radiac Meter M-78: The M-78 radiac meter is a simple portable meter with a radiation detection probe carried on a telescopic rod. The meter can be used to detect either gamma radiation or, with a cover on the end of the sampling probe open, alpha and beta radiation. Readings are given in digital form on a display located on top of the main meter unit. Also on the unit is a single control knob. The M-78 was developed by the Research Institute for Chemical Defense; it is produced by the Jianan Instrument Factory, Chongqing.

Gamma Ray Monitor M-84: The M-84 Gamma Ray Monitor is a light and portable monitoring device that appears to indicate the presence of low levels of gamma radiation by a lamp on the monitor flashing when radiation is

present. The M-78 was developed by the Research Institute for Chemical Defense; it is produced by the Jianan Instrument Factory, Chongqing.

Dosimeter System M-83: The M-83 Dosimeter System consists of a shoulder-slung plastic box containing ten individual dosimeters, a dosimeter charger/reader unit and carrying case, and a set of instructions. The M-83 was developed by the Research Institute for Chemical Defense.

TLD Thermoluminescence Dosimetry System: The TLD Thermoluminescence Dosimetry System consists of two main components: a dosimeter and a reader. It was designed to measure the personal and environmental accumulative radiation dose. The TLD Thermoluminescence Dosimetry System has a badge known as the TLD 469 containing two or three detectors. The basic detector, known as the GR-100-M, consists of chips made of an alloy of magnesium, copper and phosphorous sensitized with combined ultra-violet and thermal annealing. The GR-200 detector has a high signal-to-noise ratio while the GR-200-F uses film. There are two models of the TLD reader: Model RGD-89 and Model RGD-3. . Developed by the Research Institute for Chemical Defense, the TLD is built to full military and nuclear emergency standards.

7. Chemical and Biological Hazard Prediction, Warning and Reporting Systems:

China is not known to produce or export chemical and biological hazard prediction, warning and reporting systems.

8. Biological and Chemical Reconnaissance Vehicles and Associated Marking Systems:

China is not known to produce or export biological reconnaissance or associated marking systems.

9. Collective Protection Systems and Associated Components:

Prefilter, Particulate, M-75/2000: The M-75/2000 Particulate Prefilter has an airflow capacity of 2000 cubic meters per hour. Developed by the Research Institute for Chemical Defense and manufactured by the Xinhua

Chemical Factory, the M-75/2000 uses artificial dust for testing at full capacity for a filtration efficiency of more than 95 percent.

Filter, Gas-particulate, M-77/500: The M-77/500 Gas-Particulate Filter has an airflow capacity of 500 cubic meters per hour. The filtration efficiency is stated to be not less than 99.9999 percent against aerosols when operating at full airflow capacity. It has a life of approximately two hours when acting at full capacity against cyanogen chloride. The M-77/500 was developed by the Research Institute for Chemical Defense; it is produced by the Jianan Instrument Factory, Chongqing.

Filter, Gas, M-73/1000: The M-73/1000 Gas Filter has an airflow capacity of 1000 cubic meters per hour. It has a life of approximately two hours when acting at full capacity against cyanogen chloride. The M-73/500 was developed by the Research Institute for Chemical Defense; it is produced by the Jianan Instrument Factory, Chongqing.

10. Medical and Life Support Systems:

China is not known to produce or export medical or life support systems associated with chemical agent warfare defense.

11. Chemical and Biological Training, Maintenance and other Equipment:

China is not known to produce or export chemical and biological training, maintenance and other equipment.

THE CHINESE PERCEPTION OF CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 6:

ORGANIZATIONAL INVOLVEMENT

OVERVIEW. For security reasons, China rarely reveals the organizations involved in chemical and biological warfare or related research activities. However, there is sufficient information to form a basic picture of China's organizational involvement in the area of chemicals and chemical defense activities. Such involvement includes civilian, quasi-military and military organizations.

1. Civilian Organizational Involvement:

Ministry of Chemical Industry: In the civilian sector, the Ministry of Chemical Industry (化學工業部/huaxue gongyebu) is the senior body responsible for managing chemical-related activities throughout China. Known formerly as the Ministry of Fuel and Chemical Industry (燃料化學工業部/ranliao huaxue gongyebu) and as the Ministry of Petroleum and Chemical Industry (石油化學工業部/shiyou huaxue gongyebu), the Ministry of Chemical Industry, established in 1978, is now led by a minister (部長/buzhang) and at least four vice-ministers (副部長/fu buzhang).

The Ministry of Chemical Industry is organized by functional responsibility into at least six subordinate offices. Except for the Chemical Research Institute, which is led by a vice-president (副院長/fu yuanzhang), each subordinate office is led by a director (司長/sizhang):

a. Planning Department (計劃司/jihua si): responsible for outlining the goals and coordinating the activities of the Ministry of Chemical Industry.

b. Chemical Fertilizer Department (化肥司/huafei si): responsible for China's chemical fertilizer research and development activities. Since

agricultural production is primary among China's "Four Modernizations" campaign, China has emphasized the development and utilization of chemical fertilizers.

c. Chemical Department (化工司/huagong si): the activities of the Chemical Department are unknown.

d. Foreign Affairs Department (外事司/waishi si): responsible for the exchange of chemical-related information with non-Chinese organizations. The Foreign Affairs Department likely has a chemical and biological intelligence-gathering, analysis and production capability.

e. Chemical Research Institute (化學研究總院/huaxue yanjiu zongyuan): the activities and location of the Chemical Research Institute are unknown.

f. International Cooperation Department (characters unknown): facilitates international chemical cooperative ventures.

In addition to the Ministry of Chemical Industry, a large number of other civilian organizations are involved in chemical-related activities throughout China. These include provincial and municipal organizations; university-level education programs; and chemical production plants (化學工廠/huaxue gongchang) located throughout the country.

As the state-level coordinating body for all chemical-related activities in China, the Ministry of Chemical Industry has a global responsibility and an accountability for all chemical-related activities within China.

Methods of Contracting with China on Chemical Ventures:

Although the Ministry of Chemical Industry oversees all chemical-related activities in China, foreign chemical firms may approach China on chemical cooperative ventures through five principal channels.

First, they may use established business relationships with Chinese companies, enterprises or other economic entities to request assistance in soliciting new partners.

Second, foreign chemical firms that have not yet established business relations with Chinese groups can approach the China Council for the Promotion of International Trade (CCPIT); China International Trust and Investment Cooperation (CITIC); trust and investment agencies in the provinces, autonomous regions, and municipalities; or governmental and nongovernmental organizations to initiate such ties.

Third, representatives of chemical companies can also contact local trade units or participate in "chemical product fairs" or in various investment meetings held in localities. They can also contact Chinese groups directly to discuss potential projects.

Fourth, foreign companies can contact the economic councilor's offices or commercial councilor's offices at Chinese embassies and consulates overseas, as well as its international trade offices. Representatives will convey the inquiries of foreign companies to pertinent units in China and help introduce potential partners.

Fifth, with the development of foreign trade, China created the Association of Enterprises with Foreign Investment. Along with other consulting agencies, foreign firms can also look for Chinese partners through these governmental and nongovernmental units.

Since the pattern of foreign trade in China changed from a single-channel operation by specialized foreign trade companies--typically subordinate to specialized state-run ministries--to multichannel operations, hundreds of specialized import and export companies have been established. The China National Chemicals Import and Export Corporation (Sinochem) is still the main trading channel, while China National Chemical Construction Corporation (CNCCC) is a diversified company under the Ministry of Chemical Industry that handles import and export of chemical technologies, equipment and products (CNCCC has the right to trade directly with foreign companies). Also, the China Petrochemical International Corporation is a subsidiary of China Petrochemical Corporation (Sinopec); it engages in trade and technical cooperation with foreign companies on behalf of its parent company.

International chemical firms have encountered many more opportunities for business with China today now that the country has moved

out of the period of economic readjustment. In the 1950s China inherited from the former Soviet Union the centralized system of state trading corporations under the Ministry of Foreign Trade. The mechanism for selling to China was then relatively simple. There was little contact with the provinces, rarely with the end-user; instead, the giant trading corporations, such as Sinochem, were commissioned by the Ministry of Chemical Industry to secure the equipment required.

The First Ministry of Machine-Building (later renamed the Ministry of Machine Building Industry) later set up its own trading corporation, the China National Machinery and Equipment Import Export Corporation. Using this subsidiary, foreign businessmen could for the first time deal with engineers and technicians directly involved in production. It also meant that the Ministry, through its subsidiary corporation, could sell its products directly abroad and keep a proportion of the foreign exchange earned. The subsidiary also created possibilities for flexible forms of trading, such as joint ventures and compensation trade.

Other industrial Ministries followed suit, moving toward the creation of increasingly specialized corporations, often integrating plants in separate areas into a single production plan or coordinating the work of corporations already in existence.

In addition, the Chinese manage corporations which provide consultant services. The China International Trust and Investment Corporation (CITIC), China's nearest equivalent to a merchant bank, initiates projects and joint ventures and locates sources of foreign funds. However, connections and negotiations now generally occur through any of the five ways outlined above.

China Council for the Promotion of International Trade:

Founded in 1952, CCPIT is a national nongovernmental economic and trade organization composed of representatives of enterprises and trade circles. Its promotes China's foreign trade; attracts and utilizes foreign capital; introduces advanced foreign technology; and fosters economic cooperation with foreign countries. In the 1950's, when Western countries imposed an embargo on China in favor of the Government on Taiwan (the

Republic of China), CCPIT maintained links with Western trade organizations. By the mid-1960s CCPIT had established worldwide nongovernmental trade links. Before 1979, CCPIT was the only conduit for nongovernmental trade between China and the United States. When China adopted its "open policy" that year and official ties were established with the United States, CCPIT reorganized and spread its network, incorporating an elected leadership and representation by membership.

China Petrochemical Organization (Sinopec):

On 12 July 1983, Vice-Premier Yao Yilin led the inauguration of the China Petrochemical Corporation (Sinopec), predicating that China's largest economic entity would help rehabilitate the entire national economy in the 1980's and 1990's.

An integrated national industrial corporation modeled along the lines of the China State Shipbuilding Corporation and the China Automotive Industry Corporation, Sinopec combined 39 major petrochemical enterprises formerly operated by the Ministries of Petroleum Industry, Chemical Industry, Textile Industry and others. Sinopec also assumed a unified leadership, overall planning and management of these enterprises.

China National Chemical Construction Corporation:

On 17 February 1982, the Ministry of Chemical Industry announced the establishment of the China National Chemical Construction Corporation. Approved by the State Administrative Commission for Import and Export Affairs, the state-owned enterprise was established to manage import and export business under the leadership of the Ministry of Chemical Industry. As a legal body, it has the right to carry out foreign trade directly.

Known as CNCCC, the corporation exports complete sets of equipment; undertakes overseas chemical engineering projects; provides labor services; imports and exports chemical industry licenses and patents; and provides technical services for foreign firms. It also undertakes multiple and bilateral chemical industrial projects; introduces advanced foreign techniques; and imports sample machines, major parts, spare parts and packaging materials for export products.

Additionally, CNCCC handles joint ventures, cooperative production, compensatory trade, processing materials from customers and assembling constituent parts from customers. CNCCC also supports economic and technical work involving the Ministry of Chemical Industry.

CNCCC was a member of a Chinese delegation to Hong Kong in 1992 to inaugurate a Ministry of Chemical Industry subsidiary known as MCI. At this inauguration, China also announced the formation of branches in Japan and Europe. Liu Mingyou, chairman of the board and president of CNCCC, represented the organization, which is pursuing investment opportunities throughout south China.

CNCCC is China's major contractor for overseas chemical projects. Under Liu's leadership CNCCC made significant efforts to develop its businesses abroad and boost economic cooperation with other countries. It initially emphasized connections with new markets in the Middle East, Southeast Asia, Africa, Latin America and Eastern Europe as well as with the Commonwealth of Independent States to seek more overseas engineering contracts and to expand trade and economic cooperation. Liu claims that CNCCC's trade increased more than 20 percent between 1990 and 1991, a rise attributed to the corporation's efforts to explore new markets. Second, CNCCC opened new offices in Western Europe, Southeast Asia and the Middle East in 1992 to support its overseas market expansion program. Liu claims CNCCC plans to expand its staff in New York, Tokyo, Bangkok, Paris, Dhaka and Hong Kong. Third, the corporation will boost cooperation with its foreign counterparts and seek new partners to set up Sino-foreign joint ventures abroad, mainly to process chemical and rubber products. Fourth, the corporation plans to set up more sub-companies at home, emphasizing more Sino-foreign joint ventures on the mainland. Finally, CNCCC will expand its cooperation with China's foreign trade companies and chemical manufacturers to guarantee a greater supply of export goods.

International Initiatives:

Most of the Ministry of Chemical Industry's international activities involve foreign contacts to solicit investment in China's chemical industry and to establish chemical trade relationships. Since becoming Minister of Chemical Industry in 1989--the senior cabinet position responsible for China's civilian and military chemical programs--Ms. Gu Xiulian typically leads a

chemical delegation abroad annually. In this capacity she has visited Germany, Italy, Spain, Libya, Japan, Norway, Nepal, Thailand, Canada and United States.

Visit to North America: G i's most recent visit was this year (1995) to North America. Between 26 April and 16 May, Gu and Chen Lihua, General Director of the Ministry of Chemical Industry's International Cooperation Department, visited Canada and the United States seeking investment in China's chemical industries. The involvement of international chemical companies is a key component of China's chemical industry, as it will be through the end of the century; it is also an important part of the country's ninth five-year plan, scheduled to begin in 1996. Accordingly, Gu and Chen visited DuPont, Dow Chemical, Monsanto, Witco, Texaco, ICI Americas, Sterling Pulp Chemicals, ICI Canada, Chemetics, Eastman Kodak as well as United States' Departments of Commerce and Energy during their three-week visit.

As China's leadership concludes the final year of its eighth five-year plan, it has already established five strategic priorities for the ninth plan. According to Gu, the first is agricultural, including pesticides, fertilizers, agricultural film and other organic chemicals. This is firmly in accord with the nation's "four modernizations" campaign, which emphasizes the development of the agricultural sector above all others. The second priority is petrochemicals, aimed at supplying enough organic and synthetic materials for China's future processing industries. The third priority is "specialty chemicals", which China hopes to limit to "specialty zones" for maximum security and production efficiency . The fourth priority is to supply enough materials and parts to allied industries, such as electronics, automobiles, construction, and machinery. Finally, China will emphasize development and investment to enhance the size, technology, and service capabilities within the chemical industry. China's leadership will also enhance the training of qualified personnel to support each of the five strategic priorities.

Foreign Investment: In an interview published in *Chemical Week* in May 1995, Gu emphasized that to further develop its chemical industry, China will rely largely upon the outside world; specifically, China will seek "various kinds of opportunities to develop cooperation with foreign chemical companies for advanced technology; capital investments, equipment, and joint marketing, both domestically and abroad." According to Gu, one of the

major purposes of her visit to North America was to set up opportunities to promote cooperation with North American chemical companies, to prepare for the next steps of cooperation, and to further facilitate the development of the ninth five-year plan.

Gu claims China will also strive to modernize existing production facilities. Much of this effort will require imported high technology from abroad to increase production efficiency, to add value to the final product and to produce higher value-added products.

Gu also addressed the international concerns about protection of intellectual property rights in China, stating that to protect intellectual property rights her ministry has drafted an administrative regulation to protect agrochemicals. These steps, she claims, show China is determined to take practical measures to protect intellectual property rights. Gu also stated that China intends to enforce its activities to protect intellectual property according to the revised patent law in China and the agreements signed between governments, both unilateral and bilateral.

Internal Measures to Facilitate Integration of Foreign Technology: While Gu's comments emphasize China's reliance on international investment in China's chemical industry, Vice-Minister Cheng Siwei earlier outlined China's internal priorities. In the 8 August 1994 edition of the English-language *China Daily*, Cheng announced that China had decided to strengthen its strategic studies and "macro-control" in boosting its chemical industry by exploiting advanced technology and management techniques.

Cheng cited five spheres of the industry to be stressed: energy saving and production cost-reducing technologies for chemical fertilizers; high production and low pollution technologies concerning basic chemical materials; new technologies helping increase production and produce high-standard products in synthetic chemical materials such as rubber, resin and fiber; introduction of applied technology for manufacturing new products on the world markets; and advanced technology for producing radial tires in rubber the processing industry.

Cheng said that cooperation includes foreign companies teaching Chinese enterprises new skills or establishing high-tech joint ventures. Similar to Gu's comments, Cheng also emphasized that China's laws and

regulations would protect the intellectual property rights of the foreign technologies. He also said that there would be many opportunities for foreign cooperation and investment in China's chemical industry. To this end, the Ministry of Chemical Industry has established the Economic and Technical Committee with Cheng as its chairman and the China Chemical Industry Information Center to conduct macro-control and strategic studies. Cheng stated that the Ministry would create an organization called China Chemical Industry Economic and Technical Development Center to raise the technical base of China's chemical industries.

Ministry of Chemical Industry in Hong Kong: To facilitate its solicitation of Western investment and support of China's chemical industry, the Ministry of Chemical Industry in December 1992 set up a representative office in Hong Kong in its drive for more business connections with overseas investors. According to the South China Morning Post, the company, MCI (Holdings) Company, took over the businesses held by several chemical ministry agents in Hong Kong.

Gu Xiulian led the opening ceremonies, claiming that MCI would have a registered share capital of nearly $4 million. Gu claimed that the Hong Kong connection would allow China "to make full use of the favorable conditions" as a free trade port, to introduce foreign investment and technology, and to expand our import and export." Her hope is to use MCI and Hong Kong as a base to strengthen China's international connections and cooperation with overseas chemical, industrial, commercial and financial organizations.

The establishment of MCI continues China's effort to professionalize its chemical industries under the tutelage of its high-level technocratic leadership, some of which is at the vice-ministerial level. On 1 July 1990, the New China News Agency announced the establishment of a new trade body for chemical industry. The Chemical Industry Branch of the China Council for the Promotion of International Trade was founded in Beijing with Gu Xiulian as its honorary president and Vice-Minister Lin Yincai as president.

Relations with Western Europe: The Ministry of Chemical Industry, particularly under the leadership of Gu Xiulian, has emphasized its contacts with the countries of Western Europe. The New China News Agency reported on 20 July 1992 that China plans to expand cooperation with West

European countries in the field of chemical production and research. The move is aimed at "vigorously developing China's chemical industry and narrowing the gap between China and the world leaders in this field."

According to the article, to reach this goal, the Ministry of Chemical Industry has signed long-term, wide-ranging cooperation agreements with three world-famous chemical firms: ICI of Britain, Ciba-Geigy of Switzerland and Topsoe of Denmark. The cooperation agreements demonstrate "China's willingness to join hands with these world-leading chemical companies and research institutes on new product development; research and investment in setting up joint ventures; technical exchanges; personnel training; and trade." The article further claims that China is seeking similar pacts with French and German chemical giants to pave the way for closer ties.

He Guoqiang, Vice-Minister of Chemical Industry, identified Italy and Spain as among the most active West European states in terms of cooperation with the Chinese chemical industry. The agreements "lay a solid basis for future economic cooperation technical exchange between Chinese chemical firms and their West European counterparts," said He, who had just returned from a 22-day visit to Britain, Switzerland and Denmark. He's visit resulted in strong interest from both sides on cooperation on more than 20 farm pesticides, dyestuffs and fine chemical projects.

Relations with the States of the Former Soviet Union: The Chinese leadership has not relied solely upon the West and the Hong Kong conduit to help develop its chemical industry. In the 1 February 1993 edition of the *China Daily*, Li Zibin, Vice-Minister of Chemical Industry, announced that China would set up cooperation teams with three republics of the former Soviet Union to help exploit chemical resources there.

Li revealed that China signed letters-of-intent with Russia, Ukraine and Kazakhstan in 1992 on chemical cooperation. Li said that a national chemical company would set up a branch in Moscow, and two branches in northeast and northwest China's border areas. Not surprisingly, the company is CNCCC, subordinate to the Ministry of Chemical Industry.

Li said that China was especially interested in jointly developing and utilizing phosphate and potash ore resources in the three former Soviet states. Accordingly, China will set up joint ventures in the three countries to import

chemical fertilizers, especially phosphate fertilizer, phosphate ore, potash fertilizer and chromite, each of which is in great need in China. Li claimed China also hopes to import high-level technologies in phosphate, carbon fiber, membrane and micro-chemicals from the former Soviet states. In exchange, China will provide caustic soda, soda ash, farm pesticides and dyestuff materials and relative technologies to the countries.

Li stated that China welcomes the three countries and other states of the Commonwealth of Independent States to bring chemical technology into the China. China will extend the same preferential treatment to these countries as it does to its joint ventures with Western states. In 1992, Li led the first senior Chinese chemical delegation to pay an official visit to the three former Soviet Union republics in the past four decades.

Relations with the Middle East: In addition to working with the West and the nations of the former Soviet Union, China has pursued similar contacts with the nations of the Middle East. China rarely reveals such contacts in the open media, likely because of the sensitivities to such connections in the international arena.

Despite a lack of public acknowledgment of China's Middle East connections, such relations nonetheless exist. According to the 18 May 1992 edition of the *Middle East Defense News*, Libya and China concluded a chemicals pact in February 1992. Specifically, Libya's second in command, Major Abd-al-Salam Ahmad Jallud, held talks with the Chinese Minister of Chemical Industry Gu Xiulian to sign an agreement to expand bilateral trade. Other agreements covered economic, cultural, and scientific cooperation, according to an official communiqué.

In addition to Jallud, Gu reportedly met with the Libyan Secretary of the People's Committee for Strategic Industries. The two decided to set up Chinese-Libyan joint companies for unspecified industrial projects in Libya, with a heavy input of Chinese manufacturing technology and production expertise. According to the article, Libya was trying to establish a second chemical weapons plant at Sebha, in the desert south of Tripoli, and needed Chinese assistance for its ballistic missile projects. Of course, no such arrangement was corroborated in the Chinese press.

Partial corroboration occurred on 27 February, when Libyan television in Tripoli broadcast Gu's visit, stating that Major Abd al-Salam Ahmad Jallud received Gu Xiulian, Minister of Chemical Industries in the People's Republic of China, and the accompanying delegation. Libya announced that the meeting was attended by the brother of the Secretary of the People's Committee for Strategic Industries, the Charge d'Affairs of the Arab Libyan People's Bureau in China and the Chinese ambassador to the Great Jamahiriyah.

The March 1992 edition of the Defense & Foreign Affairs' *Strategic Policy* claimed that Gu Xiulian's visit to Libya was directly related to Libya's effort to modernize its missile industry. Specifically, the article claimed that Libya, with the help of mainland China and North Korea, had gone a long way toward modernizing its strategic missile forces. The Korean connection involves Libyan underwriting of the Nodong-1 medium range ballistic missile program, a 1,000 kilometer-range missile which is nearing preparation for export. The article claimed that in mid-December 1991, the joint Arab Libyan-North Korean Committee for Cooperation met in Tripoli to study the specific aspects of key construction, communications, transportation, and cargo transport projects toward the implementation of the surface-to-surface missile project. However, since North Korea uses such key components provided by China as rocket engineers and guidance systems for the Nodong-1 it was imperative to also coordinate export with Beijing.

Abd as-Salam Jallud, Libya's number two man, reportedly visited Beijing in January 1992, leading a high-level delegation of senior officials of scientific-technological and military industry agencies. The Libyans and several Chinese leaders, including President Yang Shangkun and Premier Li Peng, reportedly came to an agreement that China would assist the Libyan missile project via Korea; it was revealed in mid-February 1992 that Libya and North Korea would soon build a test-site for the Scud-derivative.

As part of the agreement, China would also expand its support for Libya's chemical industries, including chemical weapons and petrochemical projects. The February visit to Libya of Gu Xiulian and a "large delegation" was supposedly to sign a series of agreements on joint projects and industrial development with Jadallah al-Talhi, Libya's Secretary of the People's Committee for Strategic Industries. Gu Xiulian reportedly also discussed strengthening cooperation with Nuri al-Madani, Secretary of the People's

Committee for Scientific Research, responsible for acquisition of high technology. Both Libyan ministries are responsible for the acquisition of strategic weapons technologies.

The article claims that Libya turned to China for strategic technological assistance as an alternative to the denial of access to the West European and American technological resources. Although this appears to be a logical scenario, there is no open source confirmation that such a relationship exists between Libya and China in the missile and chemical weapons arena. However, Gu Xiulian's reciprocal high-level visit to Libya suggests that closer relations may be developing.

In addition to Libya, China also has a chemical industry relationship with Iran that has been partially corroborated in the open media. On 18 July 1986, Zheng Tuobin, Chinese Minister of Foreign Economic Relations and Trade, hosted a dinner in Beijing in honor of Iranian Deputy Prime Minister Hamid Mirzadeh and an economic delegation from the Iranian government he is leading. According to the New China News Agency, Mirzadeh also met with then-Chinese Minister of Chemical Industry Qin Zhongda and the Minister of Nuclear Industry Jiang Xinxiong to discuss a variety of issues, one of which was to finalize a venture to set-up a "joint experts committee to coordinate their cooperation in the chemical and petrochemical industries." Mirzadeh and his party visited the Yanshan General Petrochemical Corporation on 19 July.

Regional Contacts: The Ministry of Chemicals Industry has also worked to develop chemical industry relationships with regional states. In addition to Japan and South Korea, such contacts surprisingly also include Taiwan.

On 25 February 1993, the *China Daily* announced that China, Japan and the Republic of Korea (South Korea) would cooperate in the chemical and petrochemical industries. According to an unnamed official from China's Ministry of Chemical Industry, the three countries "shared a strong interest in economic and technological cooperation, trade, raising funds for Chinese chemical projects, setting up joint ventures, overseas project contracting, personnel training, joint research, the development of new technology and environmental protection." A Chinese chemical delegation headed by He Guoqiang, Vice-Minister of Chemical Industry, paid a two-week visit to the two countries in January to sign related contacts and agreements.

In Japan, CNCCC signed a contract with the Asian Glass Company Limited to introduce new technology to produce caustic soda and signed a long-term agreement with Mitsui and Company Limited of Japan. In Korea, the delegation--China's first senior chemical group to the visit the country since the two nations established diplomatic ties in 1992--signed a contract with Korean Sunkyong limited on exporting Chinese-made soda ash to South Korea. The Chinese also signed a letter-of-intent with Korea to import ethylene and acrylic materials to China and to set up Sino-Korean joint ventures on the mainland. Vice-Minister He Guoqiang's visit to Korea included a ceremony to open CNCCC's Seoul office.

Later, in November 1993, more than 300 businessmen from Taiwan and Mainland China met in Beijing to assess possibilities for cooperation in the chemical industry. The 1993 Symposium on the Chemical Industries of Both Sides of the Taiwan Straits, sponsored by a subsidiary of CCPIT, was the first such specialized meeting between Chinese and Taiwanese counterparts. The symposium was held to "detail the fields and projects for possible cooperation and exchanges of technology."

Meeting leading members of the Taiwan delegation, Vice-Premier Zou Jiahua "hoped the participants from both sides of the Taiwan Straits would carefully probe common ground and possibilities for cooperation." Zou said that over the past few years such exchanges had increased and those in specialized spheres tended to produce more concrete results.

Addressing the opening ceremony, He Guoqiang said it would make a perfect match to combine Taiwan's marketing ability, capital and application expertise with China's manpower, fundamental research and project development. He promised that the China would strive to provide convenience and preferential treatment for partners from Taiwan and would abide by the treaty on intellectual property (now a common theme among China's statements on international cooperation). According to the New China News Agency, during the four-day meeting, the participants discussed issues related to science and technology, the chemical industry, trade, rubber and pesticides.

Other Foreign Contacts: Finally, China maintains a variety of miscellaneous contacts with countries in the area of chemical industry, contacts which China's media rarely acknowledges.

One unusual connection with possible chemical ramifications occurred in 1986. According to China's New China News Agency, General Moussa Traore, President of the Republic of Mali, and his party visited an aviation school of the Chinese People's Liberation Army (PLA) in Shijiazhuang on 20 June 1986. Qin Zhongda, then-Chinese Minister of Chemical Industry, and Ma Zhanmin, Chief of General Staff of the PLA Air Force, accompanied the Malian president on his visit. Commandant Li Zhiliang briefed the visitors on the history of his school, which has trained a great number of airmen over the past 37 years. Traore reportedly inspected some of the school's teaching facilities and watched an air show of fighter planes. The Malian president and his party returned to Beijing after the visit.

On 23 June, President Traore and his party arrived in Nanjing, capital of Jiangsu Province, from Lanzhou in the company of Qin Zhongda. Jiangsu Governor Gu Xiulian, who in 1989 would become Minister of Chemical Industry, gave a banquet in honor of President Traore, his wife and their party.

On 26 June, President Traore and his party left Nanjing for an unspecified visit to North Korea. Qin Zhongda and Gu Xiulian escorted them to the Nanjing Airport.

Although the Chinese media did not directly acknowledge the chemical and military components of President Traore's visit to China and North Korea, his agenda does suggest such a correlation. However, likely due to political sensitivities and national security, China rarely reveals in open sources its military-related chemical initiatives with foreign governments. Such arrangements remain largely speculative in the open source domain.

Investment through International Financing Institutions: China finances of its chemical industry development through international financing institutions. On 31 March 1994, the New China News Agency announced that China would use loans from the World Bank and the Asian Development Bank to accelerate construction and improvement of fertilizer and chemical mining projects. Liu Mingyou, president of CNCCC, said his organization had

engaged in a dozen projects involving loans from these international agencies. He cited CNCCC as one of four corporations in China responsible for using loans from the World Bank (the others were not cited but are likely subsidiaries of other state ministries). China has entrusted CNCCC to invite bidding for procurement using World Bank and Asia Development Bank loans obtained by the Ministry of Chemical Industry through China's Ministry of Finance. China allocated the World Bank and Asian Development Bank loans to power-saving innovations in five large fertilizer factories; restructure products in five medium-sized fertilizer factories; develop of a phosphorus mine in Guizhou Province; and develop phosphate and agricultural initiatives in Hebei Province. CNCCC announced separate bidding (as opposed to package bidding) for the projects, reducing costs by nearly 10 percent.

CNCCC has also undertaken projects using soft loans from Britain, Canada and Italy and introduced technology for chemical, petrochemical, fertilizer, membrane electrolysis, steel radial tires and other projects. In addition to importing technology and equipment, CNCCC extended its business scope to cover import and export trade and contracting with foreign projects.

Specialty Zones: Although China has for years enticed foreign investment in its "Special Economic Zones" by offering tax-based financial incentives, the Ministry of Chemical Industry has only just recently adopted such an approach to develop and produce "specialty chemicals."

In a 17 May 1995 interview in *Chemical Week*, Gu Xiulian revealed that China anticipated an 8 to 9 percent growth rate during the nation's ninth five-year plan, which begins in 1996. The Ministry of Chemical Industry will emphasize agricultural chemicals, petrochemicals, and providing materials for specific industries such as electronics, automobiles, construction, and machinery throughout this period. China also plans to modernize existing plants, improve technology and expand the scale of manufacturing, training, and organizing "world-class and world-size chemical groups" within the Chinese industry. China will facilitate these aims by establishing "specialty zones" which "perfect the existing rules" for foreign firms to encourage them to do business in China. Such zones will supposedly provide foreign investors tax-based financial incentives while allowing the Chinese the physical security of limiting "specialty chemical" production to a few designated areas.

Gu stated that foreign firms' interest in China has not moderated in 1995, and that "more and more companies are getting interested in making an investment in China." Gu claims that large foreign chemical companies continue to invest in world-class production facilities in China.

Internal Initiatives:

In addition to the Ministry of Chemical Industry's myriad international chemical-related initiatives, it has also made great strides in managing China's indigenous chemical-related programs.

Chemical Process Industries (CPI): China's Chemical Process Industries (CPI) is comprised of approximately 100,000 businesses run by 19 government organizations. The Ministry of Chemical Industry controls most of China's CPI; its enterprises account for more than one-fourth of all output. The China National Petroleum Import and Export Corporation (Sinopec) accounts for about 13 percent of the total.

Agricultural chemicals are the central government's principal priority. The Ministry of Chemical Industry reportedly now spends over half its annual investment on fertilizers, which also attracts the most international funding for expansion. China's 3,500 chemical fertilizer plants, mainly smaller units with less than 100,000 tons annual capacity, have nearly tripled production in the past 15 years, from 8.69 million tons in 1978 to nearly 22 million tons in 1994. However, this total is still short of agricultural need, and each year China imports over 10 million tons of fertilizer, mostly from the United States, Canada, Russia and Europe.

To increase production of high concentration fertilizers, China began constructing 17 larger-scale plants began between 1990 and 1995, with $2 billion in loans from Japan, France, Germany, Italy and the World Bank. These include 11 large plants--each capable of making 300,000 tons of synthetic ammonia and 520,000 tons of urea annually--and five phosphate fertilizer plants with annual capacities ranging from 400,000 to 800,000 tons of ammonium phosphate.

Concerning international trade, China imported $5.8 billion in CPI products in 1994, up 31 percent from 1993; exports totaled nearly $7 billion, up percent. Approximately $1.4 billion of China's CPI imports came from the United States, $1.1 billion from Japan, and $1 billion from Europe. Japan was China's primary CPI customer, spending $1.7 billion last year, followed by Europe ($1.4 billion) and Hong Kong ($977 million).

China's Ministry of Chemical Industry has outlined the country's main CPI objectives for the next 10 years. If the goals are met, China will quadruple its size in 1980 by the year 2000. China's CPI has been growing at an annual rate of 8.3 percent in recent years, but needs are rising even faster. The 10-year goals, reported by China National Chemical Information Center, are staged in two five-year plans. As expected, China's primary focus is on agrochemicals and major petrochemicals.

The Ministry of Chemical Industry has announced several strategies to expand pesticide production, including technology transfer, joint research and development and co-production.

Indigenous Achievements: At a 25 June 1993 meeting in Beijing, Gu Xiulian and Vice-Minister He Guoqiang outlined prospects for the chemical sector, which they claimed China's central government had isolated as one of China's pillar industries.

As a result of high government interest , Gu said officials would reform the chemical industry's structure to better meet market demands and increase economic returns. Overall targets seek a growth of 9-10 percent annually in chemical output. Gu notes that China's chemical industry grew by 10 percent in 1992 to an output value of $43.6 billion. Exports rose 38 percent to $5.5 billion; imports climbed 10.3 percent to $10.6 billion.

Gu stated that in 1992, the Ministry of Chemical Industry accounted for 67 percent of China's chemical output. It controls all of China's inorganic chemical production and joint ventures associated with specialty chemicals and inorganics. In addition, the Ministry of Chemical Industry controls one petrochemical plant at the Jilin complex in the northeast, where output is mainly in inorganics. All other petrochemical sites are organized under Sinopec.

Ministry sources note that state-owned enterprises still account for more than 80 percent of China's chemical production, while collectively owned enterprises and others (mostly privatized) account for the rest. There is a trend toward consolidation, and the number of large and medium-sized enterprises has risen 26 percent to 72 percent of the nation's total output value.

Gu claims that in 1991, thanks to rapid expansion of foreign trade, her Ministry bought 2,000 items of technology and equipment at a cost of more than $4 billion.

Gu noted that current structural reform will involve a 40 percent staff cut at the Ministry of Chemical Industry and a corresponding reduction in its number of departments. But the number of institutions providing services is being increased. The Ministry has already set up China Chemical Information Center, specializing in providing services to all chemical enterprises. Others will likely follow.

Gu stated that chemical representatives from provinces and cities traditionally visit Beijing seeking support from the central government offices. After structural reform, the Ministry of Chemical Industry will have offices at the grassroots level. Gu reports that offices already exist in Pudong, Shanghai, while a Southwest United Corporation of Chemical Industry has been formed at Chengdu, Sichuan province by the merger of seven research, design, and construction institutions formerly under the control of the Ministry and Chengdu University. Most of this emphasis is so that the Ministry can help make decisions in line with "local conditions" and help develop the chemical industry in cooperation with local enterprises. Gu also noted that efforts are under way to "heighten the market economy consciousness" by sending ministry staff abroad to train and gain experience. Managers have been sent to the United States, Canada, Japan, and Hong Kong.

The reform of the Ministry of Chemical Industry has reduced its size and changed the nature of its responsibilities. It now contributes more time and energy on the development of strategy and policies and laws and regulations of the entire industry.

Privatization of the Ministry of Chemical Industry: In October 1994, China announced that a new organization would soon subsume much of the responsibilities of the Ministry of Chemical Industry. The China Haohua Chemical Industry (Group) Corporation, led by its President--Li Yijie--was to be established "in keeping with the strategic decision of Minister of Chemical Industry Gu Xiulian." Under China's enhanced open economic policy, many state-run economic sectors of China have already been privatized. Accordingly, the Ministry of Chemical Industry will likely also go through this change. When a formal decision is made on its privatization, the China Haohua Chemical Industry (Group) Corporation will take the place of Chemical Industry Ministry in taking charge of its workload.

The China Haohua Chemical Industry (Group) Corporation will have 33 corporations, including China National New Chemical Materials Corporation, the China National Chemical Engineering (Group) Corporation, China National Chemical Supply and Sales Corporation and China National Chemical Equipment Corporation, to which a total of 400 companies belong. These 400 companies have more than 10,000 production items.

The China Haohua Chemical Industry (Group) Corporation is now attempting to build information networks connecting corporations under China's control and other corporations belonging to the Ministry of Chemical Industry. It is also trying to determine which efficient production systems the Chinese industries should adopt. It is studying the expansion and new construction of manufacturing plants as well as selecting future products. In addition, it will advertise the products it intends to export as it develops as a corporation that will play a pivotal role in the China's future chemical operations.

Indigenous Production: According to Chinese accounts, China is the world's sixth-largest oil producer, yet the feedstock situation for petrochemical production in China is poor. Demand for crude oil is expected to exceed supply by the end of 1995, and a 40 million metric ton yearly import requirement is likely by 2005. China now imports and exports oil when differing qualities are required or when it needs foreign exchange. China has some interest in using its vast coal reserves for chemicals production, especially at inland sites; the Ministry of Chemical Industry has investigated the possibilities of polyvinyl chloride-from-coal and methanol-from-coal.

Reserves of salt and potash present opportunities for inorganics production.

With one-fifth of the world's population concentrated in just seven percent of the world's arable land, agricultural space is a premium in China and demands wide use of fertilizers. The country is already the third-largest fertilizer manufacturer, according to China specialist, Julian Sobin. But 76 percent of its production is nitrogen, which Sobin says, tends to be overused. Production of phosphate and potash fertilizers will develop as infrastructure projects allow extraction of the minerals. In the interim, it is often cheaper for China to import, and the amount of foreign purchases is high, running about equal to the country's 20 million metric ton per year fertilizer capacity.

The Ministry of Chemical Industry claims to operate 1,779 fertilizer plants, of which only 88 are large or medium sized. Between 1973 and 1976, 13 ammonia units were imported, each with a 300,000 metric tons annual production capacity of ammonia and 480,000-580,000 metric tons annual production capacity of urea. All use natural gas or light oil feedstock. Later, China purchased four larger plants, three based on residue oil and one on coal. In addition, China built an ammonia plant with a 300,000 metric ton annual production capacity and one energy-saving plant of its own design, capable of producing 200,000 metric tons of ammonia yearly.

The Chinese pesticide industry includes producers of raw materials and intermediates; research and development enterprises; and formulators of preparations. There are 400 pesticide producers in China, with a total annual capacity of 450,000 metric tons, turning out 150 pesticides and 480 preparations. The Chinese publish very little about the scope and nature of these products.

Inorganic Production: China has moved from being the world's largest soda ash importer to self-sufficiency. Eight key soda ash plants produce 3.4 million metric tons annually. That includes output from three new units at Tangshan, Weifang, and Lianyuang, each with an annual production capacity of 600,000 metric tons. China's total soda ash capacity is 5.37 million metric tons a year. The market suffered a 15 percent demand slide in 1991, which led to production cutbacks. In 1992, soda ash exports registered 300,000 metric tons, while domestic demand from the building and glass industries rebounded.

China exploits much of its plentiful local reserves. Salt and salt chemicals production has proven to be a successful enterprise for Binzhou district, Shandong. Production of potassium, magnesium, bromine, and iodine is growing, and links have been established with local and overseas sources to gain access to technology and latest developments. Current bromine output from Binzhou is estimated at 3,000 metric tons a year.

Nearly one-third of total sulfuric acid requirement is supplied from 29 Chinese plants, producing more than 4 million metric tons annually; China produces nearly 600 inorganic salts and about 500 varieties of dyestuffs.

Until the 1980's, a fragmented and outdated production base suffering from severe pollution problems curbed growth of aniline, used in a range of materials from polyurethanes to dyes, pharmaceuticals, and rubber auxiliaries. While output and quality have risen steadily since then, China still relies on imports to make up the shortfall.

Joint Ventures: The 11 May 1994 edition of *Chemical Week* enumerated the Chinese companies that have announced joint venture production plans. The article points out that while most of the projects already established are on a modest scale, the next few months would see the startup of a series of joint ventures that will be the first in a long line of world-scale chemical projects.

In early May, Gu Xiulian formally opened Jilin Petrochemicals, a joint venture between Allied Industries International (Hong Kong) and China's Jilin Chemical. The venture--anethylene oxide, ethoxylates, and acrylic acid complex--is especially significant for Allied, as it is the company's initial venture into the petrochemical business. Jilin, with sales of $690 million, is the largest chemical company in China; it has a strong reputation in petrochemicals and is the only company the Ministry of Chemical Industry operates independent of Sinopec.

In its 11 May 1994 edition, *Chemical Week* released the following list of Chinese organizations as being involved in international joint ventures; those marked with an asterisk (*) are under negotiation:

Company	*Chinese partner*	*Business Venture*
Akzo	NA	Peroxides, metal alkyls
Allied Group	Jilin Chemical	EO, ethoxylates, acrylic acid
Amoco	China Chemical Fiber	PTA *
	Fu Hua	
BASF	Jinling Chemical	Polyester resins
	Shanghai Dyestuffs	Organic pigments
	Shanghai Gao-Qiao	SB latex
	Yangzi Petrochemical	Styrenics
Bayer	Shanghai Chlor-Alkali	Polycarbonate *
	Shanghai Leather Chem	Leather auxiliaries
	Shanghai Coatings	Iron oxide *
	Tianjin Bohai Chemical	Hydrazine hydrate *
	Wuxi Dyestuffs	Dispersion dyes *
BOC	Shanghai Wusong	Industrial gases
Cabot	Shanghai Pacific	Carbon black
Cambrex	(not available)	Castor oil derivatives
Ciba	Qingdao Dyestuffs	Organic pigments
	Qingdao Pesticides	Insecitictdes
	Shanghai Gao-Qiao	Antoxidants
Courtaulds	(three ventures)	Coatings
CP Group	Sinopec	Ethylene *
Dow Chemical	Zhejiang Chemical	PO/PG, polyoils
DuPont	Asia Pacific Agchems	Rice herbicides
	China National Textile	Spandex fiber *
	(not available)	Adiponitrile *
Elf Atochem	(not available)	Oil Refinery complex *
FMC	Shanghai Wusong	Hydrogen peroxide *
GE Plastics	(not available)	Bisphenol A *
Henkel	(not available)	Oleochemicals *
Hoechst	China National Tobacco	Acetate tow
	Shanghai Dyestuffs	Dyestuffs *
ICI (Tioxide)	Shanghai Pacific	Titanium dioxide *
Japan group	Sinopec	Refinery-petrochemicals complex *
Kanebo	Zhejiang United Fiber	Nylon, polyester
Mitsui Sekka	Sinopec	PTA
Monsanto	(not available)	Nylon

Neste	(not available)	Polyester resin
Norsk Hydro	Suzhou Huasu Chemical	PVC resin and film
Rhone-Poulenc	Qingdao Sodium Silicate	Precipitated silica
	Shen Ma Tire Cord	Nylon-6, 6 powder
	Wuxi Chemical	Surfacants
Roche	Shanghai Sunve	Vitamins
Rohm and Haas	Beijing Dongfan	Acrylic emulsions
Shell	(under negotiation)	Refinery, petrochemicals
Vista/Exxon	Shanghai Gao-Qiao	LAB/LAS *

Development of Chemical-Related Infrastructure: China has repeatedly taken steps to increase its chemical industry base throughout the country. On 7 June 1995, the New China News Agency announced that the leadership had designated Cangzhou, in Hebei Province, as China's newest chemical industrial center.

The news item cited Cangzhou as China's third chemical industry base, to be fully operational by the year 2010 (note: China's two other chemical industrial bases lie in northeast city of Jilin and in the southwest city of Luzhou). Upon completion, the chemical industrial sector in Cangzhou will have production accounting for nearly 45 percent of the whole city. Cangzhou will reportedly specialize in petrochemical, saline chemical, and carbon-chemicals, ranging from organic and synthetic materials to plastic products.

A neighbor of the two major oil fields of Huabei and Dagang, Cangzhou boasts salt pans which turn out 1.5 million tons of raw salt every year. The city has a solid base to further develop the chemical industry, with 658 organizations now employing 62,000 workers. In 1994, chemical production accounted for nearly 25 percent of Cangzhou's industrial output.

Cangzhou is not the only place China intends to develop into a viable chemical industrial base. On 1 December 1992, China announced that Inner Mongolia Autonomous Region would become its largest chemical industrial base by the end of the century. Gu Xiulian said that the blueprint for the chemical industry development in Inner Mongolia this decade includes the factories producing urea, caustic soda, soda ash, methyl alcohol and acetic acid.

In February 1992, China also announced its intention to develop the city of Golmud in northwest China's Qinghai Province into one of the country's major chemical industrial bases in the next ten years. Golmud, located in the desert in the southern Qaidam Basin, has grown into a newly industrial city. In 1990, the central government designated Golmud as one of the country's "pilot zones" to exploit its natural resources. Since late 1980s, the country has waged a campaign to exploit the rich energy and natural resources in the barren deserts of northwest China. Under the direct instruction of senior leaders of the country, Qinghai has drafted the blueprint to turn Golmud into an industrial city.

With a population of 125,000, Golmud city is located near Qarhan Lake which has a total reserve of salt deposits exceeding 60 billion tons. It also has large reserves of the deposits of high grade minerals including lithium, alkali, copper, crystal and gold, as well as abundant hydraulic and underground water resources.

Golmud city has already completed construction of about one-fourth of its 70 square kilometer new industrial zone. New streets and highways, hospitals and schools, and communications and entertainment facilities are being constructed. Consumer goods bases are also being built near the city, which is now connected with Tibet, Xinjiang and Gansu by railways, highways and air routes. Golmud has become one of the transportation centers in the northwest; it has adopted a series of favorable policies to draw funds from outside the province. So far over 20 cooperative projects have been set up between the city and other provinces. The state government also introduced a number of large projects into the natural resources development zone, including a potash fertilizer plant and an oil refinery with an annual production capacity of 1 million tons each. Local experts expect that by the end of the century, the city will have an annual production capacity of 500,000 tons of salt, 1 million tons of potash fertilizer, 100,000 tons of potash sulphate and 1 million tons of refined oil.

On 16 October 1991, Gu Xiulian announced that China would develop the Xinjiang Uygur Autonomous Region as a major chemical industry base with efforts by the central and local governments. To meet this end, China intends to exploit the abundant resources of oil, gas, coal and salt from the vast autonomous region, which borders the former Soviet Union.

Gu pointed out that "China's priority in the energy development strategy has already been shifted from the east to the west of China and conditions are ripe for developing Xinjiang." The Ministry of Chemical Industry already endorsed the development of Xinjiang in the state overall development plan, and the autonomous regional government also put the development of oil, petrochemical, salt and salt-chemical industries in Xinjiang into the "10-year economic and social development plan" of the region and its eighth "five-year-plan." Xinjiang, an area one-sixth of China's total size, will seek regional cooperation and provide preferential terms to such cooperation in the development of the chemical base.

Environmental Concerns: The Ministry of Chemical Industry cannot promote the development of a national chemical-related infrastructure without addressing the negative environmental impact such development represents. On 9 May 1994, the Chinese Communication News Agency reported on the environmental protection work meeting of Shanxi Province, claiming that environmental pollution in the province has been "very serious." The news item noted that with the exception of the six cities directly under the provincial government, which have managed initially to check the spreading contamination of the atmosphere and surface water, the ecology of medium-sized and small cities in the province is being increasingly disturbed, and environmental pollution in some villages and towns is worsening.

Shanxi, China's energy and heavy and chemical industrial base, produces approximately 290 million tons of coal a year, and its consumption of coal increases at a rate of about 10 percent annually. At the same time, it reportedly releases one million tons of soot and 900,000 tons of carbon dioxide a year. These objective factors cast a shadow over Shanxi's already seriously polluted environment. In terms of atmospheric environmental quality, the standards for some major cities of the province is Shanxi is 130 percent poorer than that for the cities in north China.

The Shanxi group reported the results of the monitoring of the 11 major rivers and their tributaries in the province, finding that although the major rivers have not yet been contaminated, the river sections whose waters are good for drinking and industrial and agricultural purposes are very few; 85 percent of river sections are contaminated to varying degrees. The sources of drinking water and its quality in many cities have thus been adversely affected.

This grim situation has attracted great attention from the province's environmental departments. According to the news item, they expressed readiness to take an active part in comprehensive decisionmaking, to strengthen the building of the legal system and to strive to urge the provincial people's congress to promulgate before 1997 the "Regulations of Shanxi Province on Environmental Protection," the "Regulations of Shanxi Province on Prevention and Control of Atmospheric Pollution" and relevant administrative rules and standards.

Later, on 31 May 1994, Gu Xiulian announced a state-level policy for China to use environmentally clean, high-technology equipment to pull its chemical industry in line with international standards by the year 2000. Gu also called on Chinese chemical research and design institutes to work with their foreign counterparts to develop chemical technology.

Gu's comments, before a national conference in Beijing to finalize a chemical industry development program covering four years from 1996-2000, included claims that China plans to produce at least 300 new chemical products yearly under the program, which will focus on biochemistry, gas separation, catalysts, the application of computers, and five other unspecified fields.

Gu said China's "policy is to concentrate on what is advanced and new, on complete sets of equipment and special-purpose equipment, on what saves energy and on what is environmentally clean." She added that by the year 2000, 65 percent of China's 1,200 major chemical products would meet international standards.

Chemical-Related Research: According to Vice-Minister of Chemical Industry Cheng Siwei's comments before the Finnish Chemical Congress '89, China's chemical process industries (CPI) were very weak prior to the establishment of the People's Republic of China in 1949. The number of chemical products was small and the output quite low. By 1988, however, production of major chemicals had risen substantially.

China's CPI in 1989 averaged an annual growth rate of more than percent. According to Cheng, an important stimulus for this growth has been strong efforts in research and development. But Cheng admits China still has

a long way to go to catch up with worldwide scientific and technical trends. Prior to 1979, most CPI plants in China were designed and built by local chemists and chemical engineers. At that time, only a few technologies, primarily in fertilizers and petrochemicals, were licensed from foreign countries.

Between 1979-89, however, China's open-door policy enabled the country to import much technical expertise. A major objective of the Chinese government, therefore, is to adapt and refine this imported technology to local needs, thus helping to upgrade the technical abilities of local scientists, save energy and raw materials, and improve product quality.

Cheng claims that China's domestic research and development efforts have expanded in many directions. In 1989, China had more than 600 research institutes, employing some 50,000 research scientists and engineers. These researchers worked among almost all branches of the CPI, with major work being done in fertilizers, inorganic chemicals, organic chemicals, synthetic materials and biotechnology.

Cheng notes China's chemical research efforts--including those serving the CPI--fall into seven main categories.

The first and primary chemical research and development effort stems from the Ministry of Chemical Industry. Reporting to the Ministry are 28 research institutes that cover fields ranging from general chemical research to such specialized areas as automation and the diagnosis and cure of occupational diseases. In recent years, China established a series of research and development centers to promote the commercialization of new processes and products. These include fertilizers; biochemicals; organic silicon compounds; food and feed additives; water-treatment chemicals; acrylic esters; and aerosol sprays.

Second, the Central Research Institute of Science and Technology supervises the ministry's major research and development institutes. The Institute also does research on development strategies, such as planning studies of the chemical industry; technoeconomic evaluation of research and development projects; examination of chemical process simulations; studies for developing national resources; and policy studies on the developing chemical industry.

Third, other state ministries have institutes performing chemical-related research and development work. The major ones are the Research Institute of Coal Science (subordinate to the Ministry of Coal Industry) and the Research Institute of Fermentation Technology (subordinate to the Ministry of Light Industry).

Fourth, the Academy of Sciences of China--China's largest organization involved in scientific research--mainly focuses on basic and applied research, some of which is chemical-related. A few of the institutes are doing research and development work in chemicals, particularly in the areas of applied chemistry, chemical physics, coal chemistry, chemical metallurgy, materials structure and silicate science.

Fifth, local governments command about 160 research institutes subordinate to provincial and municipal governments. Such research and development work is mainly focused on solving local problems, as related to the chemical process industries. Some also obtain projects from the State Commission of Science and Technology and the Ministry of Chemical Industry.

Sixth, enterprises--chemical companies, complexes and factories--often conduct their own research. A few are large and highly qualified in specific fields. Among these institutes are: the Research Institute of Petroleum and Petrochemicals (focus principally in oil refining, petrochemicals and catalysts); the Fushun Research Institute of Petrochemicals (processing of oil shale); and the Research Institute of the Nanjing, Lanzhou and Jilin chemical companies, respectively doing work in sulfuric acid, catalysis, gas purification and ammonia synthesis; synthetic rubbers and petrochemicals; and organic chemicals.

Seventh, China has over 100 universities that have chemical technology or engineering departments. Most are working on research and development projects from governments and enterprises.

Cheng also noted that several years ago, China initiated a research and development program to exploit biotechnology. Among the endeavors are ones to improve traditional fermentation technologies for producing such

chemical products as ethyl alcohol, acetone, butanol, citric acid and lactic acid. Cheng stated that China is also studying biotechnologies to produce nitrogen-fixation microorganisms, antibiotics for agricultural use, single-cell protein and propylene amide. Cheng did not characterize these efforts.

On 3 October 1991, the Ministry of Chemical Industry announced it would reform the management of chemical engineering research institutes, colleges and universities during the remainder of the eighth five-year plan period in order to speed up the integration of production and scientific research and to make research institutes, colleges and universities play a major role "in realizing the second-step strategic objectives of the chemical industry." This was announced by Gu Xiulian at a recent national meeting of directors and presidents of chemical engineering research institutes, colleges and universities.

First, the reform measures include an effort to unify management with regard to examination and promotion in China's chemical engineering research institutes, colleges and universities. Assistance is to be given on merit, with the Ministry of Chemical Industry subsidizing the colleges and universities it evaluates as outstanding. The Ministry will also confer "favorable consideration" for a wide range of perquisites, including preferential treatment to research subjects, scientific and technological loans, capital construction investment, job distribution for college graduates, bonuses for scientific and technological personnel, inspecting work in foreign countries and introduction of intellectual resources from abroad. The Ministry plans to exclude from the plan units which fail to reach the prescribed standard after several evaluations. Eventually, they will lose their status as independent scientific research organs.

Second, the announced reforms will also establish a mechanism for spreading research achievements. The ministry will organize scientific research, designing, machine-building and engineering departments into a technology development corporation to spread the application of major research results.

Third, China will conduct internal reforms to encourage outstanding personnel to achieve greater results. While continuing the contract system and the responsibility system for institute directors and college and university presidents, chemical engineering research institutes, colleges and universities

will introduce the "target responsibility" system for directors and presidents in 1991. After signing research contracts with administrative departments, directors and presidents will enjoy the full authority to exercise their functions during their terms of office. They may carry out the policy known as "one unit, two systems," allowing them to incorporate market force factors into their decisionmaking. Internally, the Ministry of Chemical Industry will "properly distribute, reorganize and maintain scientific and technological personnel and equipment" and ensure that the new policy of special treatment and new management methods is properly sustained.

Statements on Chemical Weapons: The Ministry of Chemical Industry is also responsible for affirming China's policy on chemical weapons. On 9 September 1994, Gu Xiulian, Minister of Chemical Industry, released a news item through the state-run New China News Agency stating that China would strictly follow the limitations of the Chemical Weapons Convention.

Gu's comments, delivered at a press conference in Beijing, indicated that China would strictly carry out the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction. In 1993, the Chinese government signed the Convention and promised under no circumstances China would develop, produce, obtain, store, possess, transfer and use chemical weapons. Nor would China make any military preparations for the use of chemical weapons.

Minister Gu said although China had a viable chemical industry, it had no chemical weapons. She claimed that the Ministry of Chemical Industry had done a lot of work in implementation of supervision and control over the production, process, consumption, and import and export of chemical compounds as well as inspection of relevant equipment required by the Convention.

She also said that the Ministry had held a working meeting on implementation of the Convention on the prohibition of chemical weapons in May 1994. This meeting resulted in the establishment of a special office in charge of such work. Gu claimed that the Ministry, along with other departments, have finished preparations for domestic legislation required by the Convention.

2. *Quasi-Military Organizational Involvement:* In addition to the civilian sector, there are several quasi-military organizations in China that engage in chemical-related research and development activities. The extent of their involvement may be changing, however, as China continues to streamline the Chinese People's Liberation Army and the nature of the activities the military undertakes. Currently, the China North Industries Corporation--referred to as NORINCO--is the quasi-military organization that has the greatest responsibility for marketing China's military equipment in the international marketplace. Concerning chemical defense equipment, NORINCO both manufactures and markets products from the development and production organizations listed below. Like other manufacturing plants in China, those producing anti-chemical equipment are often also engaged in the production of civilian goods. Note that many civilian organizations that develop and produce chemical and biological defense products are also engaged in similar research for nuclear defense.

Research Institute for Chemical Defense: This is the primary quasi-military organization responsible for developing anti-chemical equipment. Although its organizational affiliation and funding is unclear, it appears to be involved with the greatest scope and variety of chemical-related research products, ranging from protective masks to chemical and biological agent detection equipment (note: its address is advertised as P.O. Box 1044, Beijing, which likely associates it with a high-level government agency of China; it may be subordinate to the Chemical Research Institute of the Ministry of Chemical Industry). The Research Institute for Chemical Defense employs a variety of quasi-military organizations and factories during the production phase of its equipment development efforts (see Chapter 5).

China North Industries Corporation (NORINCO): As cited earlier, NORINCO both manufacturers and exports Chinese military equipment. In chemical defense, NORINCO is known to produce only the Type 69 Protective Mask. With affiliated offices around China and in Hong Kong, NORINCO is based in Beijing at 7A Yue Tan Nan Street, P.O. Box 2137.

Xinhua Chemical Factory: Located in Taiyuan, Shanxi Province (Box 21), the Xinhua Chemical Factory produces the M-85 and M-65 Protective Masks. The M-65 is in service with the Chinese People's Liberation Army; the status of the M-85 is unknown. The Xinhua Chemical Factory also

produces anti-chemical collective protection systems and their associated components in service with the Chinese People's Liberation Army.

Huajiang Machinery Plant: Located in Yichang in the central province of Hubei (P.O. Box 508), the Huajiang Machinery Plant manufactures one of the several chemical and biological protective suits in service with the Chinese People's Liberation Army.

Guilin Rubber Products Factory: Located in Guilin in the southern province of Guangxi, the Guilin Rubber Products Factory manufactures China's only butyl-based chemical and biological protective suit which is in service with the Chinese People's Liberation Army.

Jianan Instrument Factory: Located in Chongqing in the western province of Sichuan (P.O. Box 2509), the Jianan Instrument Factory manufactures several radiation survey meters and detection equipment and their supporting components. Working with the Research Institute for Chemical Defense, the Jianan Instrument Factory is responsible for equipment associated with nuclear defense.

Great Wall Instrument Factory: Based in Beijing (P.O. Box 377), the Great Wall Instrument Factory manufactures chemical warfare detectors and identification kits in service with the Chinese People's Liberation Army.

3. Military Organizational Involvement:

Overview: China rarely reveals in open sources information concerning its military involvement in chemicals and chemical defense activities. All references to such involvement refer to anti-chemical troops (防化兵/fanghua bing), a term which implies a lack of an offensive capability.

The Defense Intelligence Agency's (DIA) unclassified <u>Handbook on the Chinese Armed Forces</u> (July, 1976) posits that China had an anti-chemical corps at a level commensurate with that of the Railway Engineer Corps and the Second Artillery Corps (however, this estimate was based largely upon projections of Soviet military force structure upon that of Communist China). DIA claimed that there was no confirmed Chinese doctrine on the offensive use of chemical weapons. However, they estimated that China had the

technical knowledge to develop modern chemical agents and "to add to supplies of older toxic and non-toxic agents; an offensive capability undoubtedly exists." Furthermore, DIA claimed that the organization of anti-chemical warfare units and training against chemical attack conducted by both the military and civilian populace indicated that China likely has a defensive doctrine against chemical warfare.

The DIA study claimed that the Chinese People's Liberation Army maintained anti-chemical warfare units as organic to units from army to regiment level as well as commanding some independent anti-chemical units. Their limited offensive capability included procurement, storage and distribution of chemical and biological agents; the dissemination of smoke, riot control, incapacitating and lethal agents by various means; and the tactical use of flamethrowers.

Only some of the DIA account is corroborated by the Handbook of Military Knowledge for Commanders (JPRS-CAR-88-010), a document nearly ten years more recent than the information of the DIA handbook. For example, when a Chinese People's Liberation Army infantry battalion is employed in a main offensive attack against enemy field warfare defensive positions, it may be reinforced with a variety of special units (分隊/fendui). Among these, the commander commands one to two squads each of chemical defense reconnaissance troops and flamethrower troops. During offensive combat, the chemical defense reconnaissance troops are concentrated in and controlled by the battalion and the company, which uses them according to contingency. Their main missions are to carry out chemical and radiological reconnaissance and contamination checks to ascertain the degree of enemy use of chemical agents and battlefield contamination.

Although this is the guidance China gives its field commanders, such defensive measures may be undergoing significant change. As Chinese military doctrine transforms from the tenets of guerrilla-based People's War to People's War under Modern Conditions, the role of offensive and defensive chemical warfare will likely also change. This is in full accord with the streamlining and regularization of the national military.

Anti-Chemical Corps: According to Chinese accounts, the People's Liberation Army Anti-chemical Corps is responsible for all aspects of military involvement in nuclear, chemical and biological warfare.

A Hong Kong New China News Agency report on 4 July 1987 noted that the main task of the Anti-chemical Corps is to provide protection to the army under nuclear, chemical and biological warfare conditions. The Anti-Chemical Corps is composed of observation; reconnaissance; washing and disinfection; flame-throwing; and smoke releasing units. Armed with fairly advanced light flame-throwers, the Anti-Chemical Corps reportedly serves as an attacking force directly supporting the infantry and has become an indispensable component part of the army combined arms operations. The Anti-Chemical Corps has also established some militia and reserve duty anti-chemical units as well as a professional anti-chemical contingent for people's air defense. Finally, the Anti-Chemical Corps reportedly has also engaged in research into rescue operations in nuclear and chemical industrial accidents.

Beijing convened on a "grand meeting" in Beijing on 6 December 1990 to commemorate the 40th Anniversary of the founding of the People's Liberation Army Anti-chemical Corps. A New China News Agency account noted that over the 40 years, the anti-chemical corps overcame numerous difficulties to grow from nothing to emerge as one of the military's combat supporting arms which backs up the army under nuclear and chemical warfare conditions. It reportedly now serves as an "indispensible component of the modern combined training and operation of all services and arms and an important force defending the motherland and building the four modernizations as well."

Over the past 40 years, the anti-chemical corps has reportedly successfully completed "various tasks" in national defense, disaster relief, efficiency testing, nuclear and "chemical accident salvage." During China's several border defensive wars, the anti-chemical units participating in the battle "fought bravely and tenaciously" to fulfill all anti-chemical supporting missions. Reportedly, the anti-chemical corps earned a large number of "meritorious collectives" and combat heroes. Moreover, during all nuclear test missions, the anti-chemical corps fulfilled "technical testing, efficiency experiments and security protection missions," actions which contributed greatly to the development of defense-related science and technology.

The anti-chemical corps reportedly has also established an anti-chemical warfare scientific and technological research body which contains quite a full range of research branches and is well equipped and capable of

developing advanced anti-chemical warfare equipment. Between 1978-91, this research body had registered 330 scientific and technological research achievements, of which 108 won state and military awards.

On 19 February 1986, the New China News Agency reported that the anti-chemical corps had built an "integrated army organization" with its own special school and research institute and has developed a considerable anti-chemical warfare capability. By 1986, all combined military units at and above division level had their anti-chemical branches.

The article described the anti-chemical corps as a military branch shouldering the task of guaranteeing the conduct of military actions under the conditions of a nuclear, chemical or biological battle. The military branch, established in 1950, has indigenously-produced equipment for observation, reconnaissance, protection, cleaning and disinfection.

The New China News Agency article noted that the anti-nuclear, anti-chemical and anti-biological training of China's combined military units was undergoing three major changes. First, they have shifted the emphasis of their training from learning general knowledge about nuclear and chemical weapons to mastering the tactics and techniques of resisting attacks by those weapons. Second, they have moved from studying the organization and equipment of the enemy to studying the enemy's principles, methods and opportunities for using nuclear and chemical weapons. Third, they have moved from training in personal protection skills to training in organizational action to protect whole army units.

The article concluded by noting that China is reducing the number of ordinary troops and strengthening special troops to raise the combat capacity of its army. As a special military branch, the anti-chemical corps is stepping up its modernization and the training of its commanders and soldiers. Sources in the anti-chemical corps said that they were making efforts to apply scientific achievements, new technologies and new materials to develop highly efficient protective equipment. They will intensify anti-nuclear and anti-chemical training so that the troops will be able to fulfill effectively "all battle tasks in a future anti-nuclear war."

THE CHINESE PERCEPTION OF CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 7:

PERSONNEL INVOLVEMENT

OVERVIEW. The Chinese rarely reveal the names of personnel involved in chemical and biological warfare-related activities. However, there is sufficient information to form a basic picture of the people involved in such initiatives and of the nature of their efforts to control and promote chemical activities in China and around the world. Often such involvement incorporates professionals who have served in civilian and military posts over a long career of state service. Such involvement is apparent in several of the individuals associated with the Ministry of Chemical Industry and quasi-official organizations as well as among those who report on chemical and biological research in the open media. Information on military members associated with chemical and biological warfare is nearly non-existent.

1. Members of the Ministry of Chemical Industry:

As the senior body responsible for managing China civilian and military chemical-related activities, the Ministry of Chemical Industry is led by a minister and four or five vice-ministers:

a. Minister Gu Xiulian (顧秀蓮): Born in 1930, Ms. Gu Xiulian is a native of Nantong, Jiangsu Province. Among her many accomplishments is her service as China's first woman provincial governor, leading Jiangsu from 1983-1989. A tireless organizer and worker, Gu also has a high degree of political acumen, as demonstrated by her substantial achievements in a socio-political system where men still predominate. Her professional qualifications are as follows:

1989-95:	Minister of Chemical Industry
1983-89:	Governor, Jiangsu Province
1973-82:	Vice-Minister in Charge of the State Planning

	Commission
1964-69:	Technician, Ministry of Textile Industry
1961-64:	Secretary, Jinchuan Nonferrous Metal Company Machine Repair Plant
1961:	Graduate, Shenyang Machinery School

b. Vice-Minister Tan Zhuzhou (谭竹洲): Born in 1936, Vice-Minister Tan Zhuzhou is a native of Pingdu, Shandong Province. While he has served as Vice-Minister of Chemical Industry since 1983, he also studied in the former Soviet Union early in his career. In 1992, Tan led China's first chemical delegation to Southeast Asia, seeking regional cooperative ventures. Although Tan was the senior Vice-Minister and logical choice to head the Ministry of Chemical Industry following Qin Zhongda's resignation in the wake of the Tiananmen crisis in 1989, Premier Li Peng apparently orchestrated the promotion of Ms. Gu Xiulian over Tan as Minister. Tan's professional qualifications are as follows:

1983-95:	Vice-Minister of Chemical Industry
1980-83:	Director, Shanghai Municipal Chemical Industrial Bureau
1978-79:	Manager and Chief Engineer, Shanghai Organic Chemical Industrial Corporation
1965-69:	Deputy Manager, Shanghai Plastic Industrial Corporation
1957-60:	Deputy Director, Branch Factory, Shanghai Chemical Plant
1956-57:	Student, USSR

c. Vice-Minister Pan Liansheng (潘连生): Born in 1932, Vice-Minister Pan Liansheng is a native of Yancheng, Jiangsu Province. While he has served as Vice-Minister of Chemical Industry since 1986, he has a long history of state service in the chemical industry, including election as the 34th president of the Chemical Industry Society of China in 1986. Pan's professional qualifications are as follows:

1986-95:	Vice-Minister of Chemical Industry
1984-86:	Director, Jilin Chemical Industrial Corporation and Director, Planning Department, and Senior Engineer, Ministry of Chemical Industry

1982-84:	Deputy Chief Engineer and Department Manager (location unknown)
1979-82:	Plant Director (location unknown)
1963-66:	Director, Research Office (location unknown)
1958-63:	Workshop Director, Jilin Dyestuff Plant
1954:	Graduate, Engineering Department, Dalian Engineering Institute

d. Vice-Minister Cheng Siwei (成思危): The Chinese State Council promoted Cheng Siwei to Vice-Minister of Chemical Industry in June 1994 from Vice-President of the Ministry's Chemical Research Institute. In the early 1990's . Cheng was Chief Engineer, Scientific and Technological Research Institute, also part of the Ministry of Chemical Industry. These positions suggest that Cheng may be involved with the Ministry of Chemical Industry's chemical research initiatives.

Cheng typifies the type of "technocrat" China's State Council has promoted to the Ministry of Chemical Industry since about 1982. He received his bachelor's degree from the East China College of Chemical Engineering (Shanghai) and holds a Master's Degree in Business Administration from the University of California at Los Angeles. He is a national committee member of the Chinese People's Political Consultative Conference, and is a member of that organization's Science and Technology Committee.

Cheng's professional qualifications are as follows:

1994-95:	Vice-Minister, Ministry of Chemical Industry
1991(?)-94:	Vice-President, Chemical Research Institute, Ministry of Chemical Industry

e. Vice-Minister He Guoqiang (贺国强): The Chinese State Council promoted He Guoqiang to Vice-Minister of Chemical Industry in March 1991. Previously, He served as Director, Shandong Provincial Petrochemical Industrial Department; the Shandong Provincial People's Congress promoted him to this position in February 1984. Since his promotion, He has been actively promoting international chemical-related contacts, particularly regional contacts with Japan, South Korea and Taiwan. He's professional qualifications are as follows:

1991-95:	Vice-Minister, Ministry of Chemical Industry
1984-(?):	Director, Shandong Provincial Petrochemical Industrial Department

f. Vice-Minister Li Yongwu (李勇武): The Chinese State Council promoted Li Yongwu to Vice-Minister of Chemical Industry in March 1995. Li possibly replaced former Vice-Minister Li Zibin in this capacity and thus may be involved in international chemical activities with the Russia and its former client states. Li Yongwu's professional background is unclear. The Standing Committee of the Tianjin Municipal People's Government named him Director, Municipal Chemical Industrial Bureau in March 1991. In September 1993, the Tianjin Municipal Government elected him Chairman, Tianjin Municipal Economic Commission. It is unclear whether Li managed chemical activities as part of his economic commission responsibilities. Li's professional qualifications are as follows:

1995:	Vice-Minister of Chemical Industry
1993-95:	Chairman, Tianjin Municipal Economic Commission
1991-93:	Director, Tianjin Municipal Chemical Industrial Bureau

g. Former Minister Qin Zhongda (秦仲达): Born in 1923, Minister Qin Zhongda is a native of Rongcheng, Shandong Province. While he has served as Minister of Chemical Industry from 1982-1989, he has a lengthy history of state service in the chemical industry, including a period early in his career performing research for a military ordnance organization. Qin replaced Sun Jingwen as Minister of Chemical Industry in March 1982 at the relatively young age of 58; his promotion was part of a national effort to replace state bureaucrats with younger, more capable technocrats. Qin resigned his post in July 1989, likely due to his close association and political affiliation with ousted premier Zhao Ziyang; current Minister Gu Xiulian succeeded him in this position. Qin's professional qualifications are as follows:

1994-95:	Vice-Chairman, Environmental and Resources Protection Committee, National People's Congress
1982-89:	Minister of Chemical Industry
1978-82:	Vice-Minister of Chemical Industry

1970-78:	Leader, Chemical Production Group, Ministry of Fuel and Chemical Industry and Deputy Leader of Comprehensive Planning Group, Ministry of Petrochemical Industry
1965-68:	Director, Production Management Department, Ministry of Chemical Industry
1956-65:	Deputy Director, Capital Construction Department and Deputy Director of Equipment Department
1952-53:	Deputy Director of Chemical Industrial Bureau, Industrial Department, Northeast China People's Government
1950-52:	Director, Dalian Chemical Plant
1948-50:	Deputy Director, Dalian Chemical Plant
1945-46:	Deputy Director, Industrial Research Office, General Ordnance Factory, Jiaodong Military Command

h. Former Vice-Minister Lin Yincai (林殷才): Born in 1930, former Vice-Minister Lin Yincai is a native of Zhenhai, Zhujian Province. Vice-Minister of Chemical Industry from 1982-91, Lin studied in the former Soviet Union early in his career. Li Zibin replaced Lin as Vice-Minister in 1991. In 1993, Lin resurfaced as Chairman of the Sub-Council of Chemical Industry, China Council for the Promotion of International Trade (CCPIT) (CCPIT is a source of economic information and acts as a liaison between China and foreign business; it has a staff of linguists who can facilitate international contacts in English, Arabic, French, German, Spanish and Japanese; see Chapter 6 for details). Lin's professional qualifications are as follows:

1993:	Chairman, Sub-Council of Chemical Industry, China Council for the Promotion of International Trade (CCPIT)
1982-91:	Vice-Minister of Chemical Industry
1958-82:	Deputy Director, Synthetic Rubber Plant, Lanzhou Chemical Industrial Corporation
1956-57:	Student of petrochemical enterprises, Baku and Sumgait, USSR
1950-55:	Technician, Deputy Workshop Director, Jinxi Chemical Plant

i. Former Vice-Minister Wang Min (王民): Born in 1929, former Vice-Minister Wang Min is a native of Haiyan, Zhejiang Province. While she served as Vice-Minister of Chemical Industry from 1984 to about 1993, she has a long history of state service in the chemical industry. Wang's professional qualifications are as follows:

1984-93(?):	Vice-Minister of Chemical Industry
1983-84:	Director, Planning Department, Ministry of Chemical Industry
1977-83:	Deputy Director and Chief Engineer, Beijing Municipality Chemical and Industrial Bureau
1956-73:	Director and Deputy Director, Beijing Chemical Plant
1950:	Graduate, Department of Chemistry, Qinghua University

j. Sun Jingwen (孫敬文): Former Minister of Chemical Industry Sun Jingwen has had a long career of state service to China supporting myriad chemical-related initiatives and programs. China's factional strife has impacted Sun's career on many occasions. A revolutionary who enjoys the prestige of party affiliation from the 1930's, Sun nevertheless dropped out of sight during the Cultural Revolution; he emerged at the ministerial level in the mid-1970's. Premier Zhao Ziyang replaced him with technocrat Qin Zhongda in 1982; Sun was retained as a Ministry advisor and later became Vice-President of the ubiquitous China National Petrochemical Industry Corporation. Sun's professional qualifications are as follows:

1935:	Joined Chinese Communist Party
1936:	Chief Liaison, Peiping (Peking) Students Federation
1937:	Attended Central Party School, Ye'nan
1938-48:	Secretary, Communist Party of China General Branch; Director, Business Department, Xinhua Daily, Chongqing; Director of Propaganda Department, CPC Hebei-Rehe-Chahar Region
1949-52:	Vice-Chairman, Chahar Provincial Government
1958:	Vice-Minister of Urban Construction
1958-64:	Vice-Minister of Petroleum Industry
1964-66:	Vice-Minister of State Capital Construction Committee

1971-75:	Vice-Chairman, Tianjin Municipal Revolutionary Committee
1975-78:	Vice-Minister of Petrochemical Industry
1978-82:	Minister of Chemical Industry
1982:	Advisor to the Ministry of Chemical Industry
1982-95:	Vice-President, China National Petrochemical Industry Corporation

k. Kang Shi'en (康世恩): Former Chinese Vice-Premier Kang Shi'en, who died at age 80 in April 1995, was a major figure impacting the development of China's petrochemical industry. The New China News Agency's obituary of Kang described him as an "outstanding pioneer and leader of China's petroleum and petrochemicals industries."

Born in Huai'an, Hebei Province in 1915, Kang joined the Communist Party in 1936 and the prestigious communist Eighth Route Army in 1937, and went on to become a senior military official following the communist victory in the civil war in 1949. Kang became Assistant-Minister of Petroleum Industry in 1955 and Vice-Minister in 1956, a position which he held until 1967.

During the Cultural Revolution in 1966 Kang was attacked as a collaborator of revisionist Deng Xiaoping; in May 1967 he was accused of being a "henchman" of Yu Qiuli, also later a Vice-Premier; Kang was purged until 1971. His political fortunes were revived in January 1975 when he became Minister of Petroleum and Chemical Industries until 1978, when he was named Vice-Premier and Minister of the Economic Commission. Kang served as Vice-Minister and Minister of Petroleum Industry for more than two decades, finally becoming the China's Vice-Premier in 1978 at roughly the same time as Deng assumed control of China.

Kang was implicated along with Song Zhenming--who was later relieved of his post--as "incompetent" for failing to heed the safety precautions which led to an oil rig disaster that killed 72 workers in 1979. Despite being censured, Kang served as Vice-Premier until 1982 when he was appointed State Councilor, a position he held until 1988.

Kang also held the posts of Vice-Minister in Charge of the State Planning Commission and Vice-Chairman of the State Energy Commission.

He was also a member of the Standing Committee of the Central Advisory Commission of the Communist Party of China.

Kang's professional qualifications are as follows:

1935:	Student, Qinghua University
1936:	Joined the Chinese Communist Party
1936-37:	Led the Qinghua University Squadron, Chinese National Liberation Vanguard Corps
1937:	Joined the 8th Route Army
1937-40:	Chairman, Shuoxian County Battlefield Mobilization Committee (against Japan); head of United Front Work Department, Communist Party of China Shuoxian County Committee; Head, Organization Department, Taiyuan Central District Committee, Shanxi Province Sacrifice League for National Salvation
1940-46:	Commissioner, Shanxi-Jehol Eighth District Administrative Office
1946-49:	Head, Political Department, Yanmen Military Area; Head, Divisional Political Department. First Field Army
1949-55:	Director, Northwest China Petroleum Administration Bureau; Director, General Petroleum Administration Bureau (under Ministry of Fuel Industry)
1955-78:	Vice-Minister of Petroleum Industry; First Vice-Minister of Fuel and Chemical Industries; Minister of Petroleum and Chemical Industries
1976-82:	Vice-Premier and concurrently Minister in Charge of State Economic Commission; Vice-Chairman, State Energy Committee
1982:	State Councilor
1987:	Member, Standing Committee, General Advisory Commission

l. Song Zhenming (宋振明): Former Vice-Minister of Chemical Industry Song Zhenming first appeared nationally in 1972 as a member of a Chinese petroleum delegation to Canada. He later became associated with

China's famous Daqing Oilfield, a model of socialist efficiency that the Chinese leadership often cites as indicative of the high standards the Chinese people can achieve through self-reliance and hard work. Closely associated with Kang Shi'en, Premier and former Minister of Chemical Industry, Song was relieved of his position as Vice-Minister of Chemical Industry in 1980 following his failed attempts to suppress an investigation of an oil rig disaster in the Bohai Gulf in 1979 that killed 72 Chinese workers. Years later, Song emerged as a general manager of land-based petroleum exploration.

Song's career included the position of Minister of Petroleum; in this capacity, he led a government delegation to Iraq and Iran in July and August 1978, respectively. Song's professional qualifications are as follows:

1972:	Member, Petroleum Delegation to Canada (no further information)
1974-76:	Vice-Chairman, Revolutionary Committee of Daqing Oil Field
1976:	Cadre (unspecified), State Council
1978-80:	Minister of Petroleum Industry
1983:	Leader, Zhongyuan Oil Field Development Group, Ministry of Petroleum Industry
1985:	General Manager, Chinese National Petroleum Development Corporation

m. Li Zibin (李子彬): Former Vice-Minister of Chemical Industry Li Zibin replaced Lin Yincai as Vice-Minister of Chemical Industry in December 1991. During Li's tenure, he managed international chemical initiatives with Russia and its former client states. For unknown reasons, the State Council removed Li of his post on 10 January 1995; current Vice-Minister of Chemical Industry Li Yongwu was likely his replacement. Li Zibin's tenure as Vice-Minister of Chemical Industry lasted only four years, a relatively short period of service. His name is not appeared in the Chinese media since January 1995 (note: the major of Shenzhen, one of China's highly-visible Special Economic Zones, is also named Li Zibin; they are different individuals). Li's professional qualifications are as follows:

1991-95:	Vice-Minister of Chemical Industry

n. Feng Bohua (馮伯華): Former Vice-Minister of Chemical Industry; no further information is available.

1979(?)-84(?): Vice-Minister of Chemical Industry

o. Jia Qingli (賈慶禮): Former Vice-Minister of Chemical Industry Jia Qingli became a symbol of bureaucratic corruption in 1983 when it became public that he had used his official position for personal gain. In December 1983, Jia wrote a "self-criticism" in the *People's Daily* admitting he had misappropriated state funds for personal gain. The State Council removed Jia of his post to alert other bureaucrats of the harsh response to corruption. No further information is available.

1979(?)-84(?): Vice-Minister of Chemical Industry

p. Yang Guangqi (楊光啓): Former Vice-Minister of Chemical Industry Yang Guangqi served in this capacity from 1982-1985. In 1985, the State Council appointed Yang Vice-President of the China International Trust and Investment Corporation (CITIC); he later became Vice-Chairman before resigning his post in April 1995. CITIC is responsible for about 20 percent of China's international investments. Yang's resignation came in the wake of a financial scandal involving misuse of investment funding at CITIC; although there is no confirmed connection between Yang and the CITIC incident, there is likely some connection. Yang's professional qualifications are as follows:

1985-95:	Vice-President (later Vice-Chairman), China International Trust and Investment Corporation (CITIC)
1982(?)-85:	Vice-Minister of Chemical Industry

q. Li Guocai (李國才): Former Vice-Minister of Chemical Industry Li Guocai served in this capacity from about 1978-80. In 1980, the State Premier dismissed Li for making false claims and surpressing an investigation on the effectiveness of equipment developed by units he managed earlier in his career. Li, whom many considered as someone who abused his position of power and socialist convictions to influence perceptions and events, was publicly disgraced as a warning to bureaucrats that the State Council would not tolerate corruption. With his dismissal, Li became one of the first in a

long series of leftist bureaucrats to suffer public humiliation following China's Great Proletarian Cultural Revolution.

1978(?)-80	Vice-Minister of Chemical Industry
1976(?)-78:	Vice-Minister of Chemical and Petroleum Industry

r. Yang Yibang (杨义邦): Former Vice-Minister of Chemical Industry Yang Yibang had an apparent short-lived career in the chemical business. The New China News Agency reported on 27 July 1983 that the Communist Party Central Committee Discipline Inspection Commission placed Yang on two years probation within the Party and relieved him of all Party posts for "actions in violation of Party discipline and government regulations." Yang was later removed as Vice-Minister of Chemical Industry for corruption associated with his Hong Kong-based international contacts.

1981(?)-83	Vice-Minister of Chemical Industry

s. Yang Yepeng (杨叶澎): Former Vice-Minister of Chemical Industry Yang Yepeng was likely a political appointee who was soon relieved of his position; no further information is available.

dates unknown	Vice-Minister of Chemical Industry

t. Tao Tao (陶涛): Former Vice-Minister of Chemical Industry Tao Tao has had a long career of state service in chemical research. In December 1978 he was elected President of the Chemical Engineering Society of China. A former Vice-Minister of Chemical Industry, it is unclear why he now serves as Director of its Technological Committee, a position which appears to be much junior to that earlier post; he may be a consultant or advisor. No further information is available.

1991	Director, Technological Committee, Ministry of Chemical Industry
1977(?)-80(?)	Vice-Minister of Chemical Industry and earlier Vice-Minister of Petroleum and Chemical Industries

u. Li Yilin (李义林): Former Vice-Minister of Chemical Industry; no further information is available.

1978(?)-81(?) Vice-Minister of Chemical Industry

v. Others: Other functional managers in the Ministry of Chemical Industry include the following:

1.) Zhou Shijun (周士钧), Director, Planning Department
2.) Wang Jiamin (王家敏), Director, Chemical Fertilizer Department
3.) Yan Jiaming (閻家銘), Director, Chemical Department
4.) Zhang Gengxin (張庚辛), Director, Foreign Affairs Department
5.) (name unknown), Vice-President, Chemical Research Institute
6.) He Fan (characters unknown), Director, Department of International Cooperation
7.) Chen Lihua (characters unknown), General Director, Department of International Cooperation (note: Chen may have succeeded He Fan in this capacity)

2. Politicization of the Ministry of Chemical Industry:

The Ministry of Chemical Industry, the supreme authority for military and civilian chemical-related activities throughout China, has been highly politicized since it was established in 1978. Much of the controversy develops because the Premier of China's State Council appoints the Minister of Chemical Industry leadership through the "rubber stamp" approval of the National People's Congress Standing Committee. Accordingly, the Ministry of Chemical Industry staff is typically comprised of people who are deemed qualified because of perceived political or personal reliability, not because of exceptional technical or managerial competence. Consequently, when China promotes a new state premier, the existing Ministry of Chemical Industry leadership is often ousted because of "incompetence, corruption or reorganization of state bureaucracy." Such criticisms are frequently exaggerations or "trumped up charges" to justify and facilitate their dismissal and to emphasize the integrity of the new premier.

The careers of five chemical industry leaders--Li Guocai, Song Zhenming, Yang Yibang, Qin Zhongda and Gu Xiulian--illustrate how

China's factional strife--a struggle between left and right, between socialist ideals and "Westernization"--has impacted the Ministry of Chemical Industry. What is less clear is how China's chemical industry leadership and personnel issues have impacted the morale of its bureaucrats, the goals they establish and the programs they oversee.

a. Li Guocai: Consider first the case of Li Guocai, former Vice-Minister of Chemical Industry. On 23 November 1980, China announced that the State Council had dismissed Li for "grave mistakes in ideology and style of work as well as incompetence" while leading the Jilin Chemical Industrial Company. The leadership criticized Li for "becoming arrogant, imperious and despotic, deceiving his superiors, discriminating against his subordinates and practicing fraud by exploiting his position of honor" during China's Cultural Revolution. China's labor departments also denounced Li for "a fraud of seven years" involving an industrial boiler named after him. The Central Commission for Inspecting Discipline and the Organization Department of the Central Committee of the Communist Party of China and the Provisional Party Committee of the state organs thoroughly investigated the case. The Ministry of Chemical Industry filed a report to the State Council, which approved Li's dismissal on November 11.

Earlier, the China state-run media criticized Li for his failures. The 20 September 1980 editions of the People's Daily and Workers' Daily each carried reports, letters and related materials concerning what became known as the "Guocai-type boiler." These accounts revealed that Li Guocai was originally head of a processing group in the construction corporation under the Jilin Chemical Industrial Company. During the Cultural Revolution, he reportedly became one of the leaders of the "Red Rebel Headquarters" and the "Red Guards Corps" and was promoted to commander-in-chief of the militia of Jilin Municipality, a Standing Committee member of the Municipal CCP committee, Vice-Minister of the Petroleum and Chemical Industries and Vice-Minister of the Chemical Industry.

The media accounts claim that in about 1972, the processing group Li managed designed and manufactured a boiler, named in the drafts as the "Guocai-type great upright horizontal-tubed steam boiler" or simply "Guocai-type boiler." For a long time there was unit-level opposition to Li's excessive claims on the performance and value of the equipment. Li reportedly became

annoyed about this and arbitrarily linked these units' suggestions to the "struggle between the two lines"; as a result, he vehemently accused scientific and technical personnel of being "bourgeois authorities." In the meantime, Li used the propaganda media to lavishly praise himself and suppress the scientific and technical personnel. To promote himself, Li reportedly eventually named the boiler the "Guocai-type boiler" and the processing group the "Li Guocai processing group."

In October 1977, the Jilin Provincial Labor Bureau invited engineering and technical personnel who were well versed in boiler design, manufacture and utilization to form a joint investigative team to conduct a technical appraisal of a Guocai-type boiler used at the Jilin municipal transport company. When then Vice-Minister Li heard the news, obstructed the investigation to prevent the assessment to continue.

In December 1978, supported by concerned departments, the Jilin Provincial Labor Bureau again brought together 33 engineering and technical personnel from 25 well-known boiler plants and research institutes in the country to assess the Guocai-type boiler. The assessment data showed that the boiler's structure and technical and economic indexes all did not approach the high standards Li and his backers had advertised.

Despite the bureau's findings, "elements within the Ministry of Chemical Industry" rejected the scientific technical assessment and implemented its own obstacles, preventing the results from being publicized. Consequently, the State Economic Commission decided to assess the boiler independently. However, the Ministry of Chemical Industry--apparently at Li insistence--refused to cooperate in the inquiry.

The Guocai boiler issue became highly politicized as Vice-Minister Li's reputation depended on the outcome. Li Guocai had used the perceived success of the boiler to rise rapidly through the political ranks; he had become Vice-Minister of Petroleum and Chemical Industries and later Vice-Minister of Chemical Industry.

By November 1980, however, Li could no longer defend himself; the State Premier eventually dismissed him with a "no confidence" vote.

b. Song Zhenming: Li Guocai's dismissal was not an isolated incident, but rather part of a greater national anti-corruption campaign in 1980. Earlier, on 25 August 1980, the State Council relieved Minister of Petroleum Industry Song Zhenming of his post and censured Vice-Premier in Charge of the Petroleum Industry and former Minister of Chemical and Petroleum Industry Kang Shi'en because of "an important dereliction of duty" in an oil rig accident in November 1979 that cost 72 lives and a heavy loss of state property. The oil rig, the "Bohai Number 2", capsized on 25 November in the Bohai Gulf while being towed away from a typhoon threat. The State Council said the accident was a result of Song's negligence and refusal to follow safety procedures. News of the November accident was not made public until July.

Song, a founder of the model oilfield at Daqing in northeast China, asked to be relieved after undergoing tremendous public criticism. He admitted that the ministry leadership's "arrogance and complacency, grave bureaucratism, disrespect for science and for the opinions of workers, technicians and grassroot cadres, and violation of the operating regulations in guiding production" led to the accident.

The State Council claimed Song covered up the incident, lied to authorities and failed to take direct action against those responsible. The State Council censured Vice-Premier Kang, himself once Minister of Petroleum and Chemical Industries, because he "did not take the accident seriously or deal with it promptly, although he is directly responsible for leading this work on behalf of the state council" (a long-time petroleum expert, Kang had been criticized twice before in his career; he was purged as a counter-revolutionary in 1967 before re-emerging following several years of political "rehabilitation").

The collapse of the rig reportedly caused a controversy inside the Chinese hierarchy on the disclosure of corruption in the official media. Song Zhenming was reportedly willing to produce a "self-criticism" on the incident, but he argued against attempts by China's central television station to report it. In the interim, a number of China's citizens had become aware of the disaster and were waiting to see if the leadership would publicize it. The issue went beyond sensationalism to a greater question of incompetence among some party officials and whether such failings should open to public scrutiny as a way to overcome them.

Finally, on 27 August 1980, the New China News Agency released the text of Song's "self-criticism," in which he declared responsibility for the Bohai Number 2 oil rig disaster and tendered his resignation. The Agency also transmitted the full text of the State Council decision of 25 August which placed the blame for "this needless disaster" on the "leadership of the Ministry of the Petroleum Industry" for its "failure to respect science and neglect of safety precautions." The decision confirmed the dismissal of Song Zhenming and censured Kang Shi'en for his weak leadership. In all, China indicted four oil industry supervisors on charges of criminal negligence in the offshore drilling rig disaster.

Many Chinese leaders viewed Li and [illegible] dismissal as a move to "set an example" of the Chinese leadership's determination to hold bureaucrats and managers accountable for fraud and ineptitude. However, the State Council's action against Song was significant because it affected a key member of Deng Xiaoping's senior team of management pragmatists, not aging Maoists, who had previously typified those publicly criticized and dismissed. By demonstrating openly that even "Dengists" were not above accountability, the leadership according to the New China News Agency "underscored a dubious bureaucracy that it is serious about its commitment to government by law and to promotion and demotion by competence and skill."

Following his "self-criticism" and subsequent dismissal, Song Zhenming "resurfaced" as General Manager of the China Petroleum Development Corporation, an organization created in 1985 to manage China's newly-opened onshore oil exploration activities (China National Offshore Oil Company was founded in 1982 to manage offshore exploration). Song re-emerged as more than just a political functionary; in July 1985, the Communist Party newspaper People's Daily announced that China would open more onshore oil exploitation areas to foreign exploration. It quoted Song as saying 19 companies from the United States, Britain, France, Italy, Japan, West Germany, the Netherlands and Romania have been invited to survey oil resources in Xinjiang, Shaanxi, Gansu, Ningxia and Sichuan provinces. Song had returned apparently with authority conclude international agreements and announce policy changes and achievements through the state-run media.

If there is any doubt that Deng Xiaoping's opponents sacked Song for political gain, consider the New China News Agency's 28 June 1990 report of Song's death on 13 June. The news item reported that on 26 June, a ceremony was held in Beijing to commemorate Song, who died at age 64 in Daqing. The article described Song as follows:

> "[Song was a] former Minister of Petroleum Industry and General Manager of the China National Petroleum Development Corporation. Born in 1926 to a peasant family in Hebei Province, joined the revolution in 1938 and joined the Chinese Communist Party in 1942. During his life, Song was a teacher, political instructor at a company, director of the political department of an independent regiment, and deputy director of the personnel department of the Ankang Prefectural Military Command before liberation in 1949. After liberation, he held the posts of Director of the Transport Section of the Yumen Mining Administration, Director of the Oil Mining Plant, Deputy Head of the Headquarters for the Development of the Daqing Oil Field, Secretary of the Party Committee of Daqing, Vice-Minister of Petrochemical Industry, Minister of Petroleum Industry and Vice-Minister of the State Energy Commission and Head of the leading group for development of the Zhongyuan Oil Field. Song was a deputy at the 10th and 11th National Congresses of the Communist Party of China and a Deputy at the Sixth National People's Congress. Song had worked for 38 years in the petroleum industry, making great contributions to its development. Under his direction, the Daqing Oil Field became a model for China's industry for decades."

Nothing was written in Song's eulogy on his dismissal for incompetently handling the 1979 Bohai Gulf oil rig crisis.

By March 1982, Premier Zhao Ziyang announced plans for China to streamline its state bureaucracy as part of an effort to professionalize its leadership. The upshot of this effort was to cleanse the bureaucracy of corrupt, elderly and leftist officials said to be blocking national modernization plans and to avoid the type of politicized issues such as those of Li Guocai and Song Zhenming.

China's lawmaking body adopted a tough, new anti-corruption law allowing the death penalty for serious offenders; it also adopted China's first mandatory retirement statute, which required officials of ministerial rank to retire at age 65 and vice ministers at 60.

Part of this effort was to revamp the leading state councilship to a cadre of "younger, better educated and professionally more competent" leaders. China, ruled by the Chinese Communist Party, is administered by a state government apparatus headed by a State Council that implements party's decisions; essentially, the people who run the party generally also run the government or entrust it to their allies.

The March 1982 reforms instituted proposals to "relieve" ministers in their late sixties and seventies who were disqualified by age or misfeasance or political unacceptability to the pragmatic leaders now assuming control of the nation. Under this authority, State Council Premier Zhao streamlined the Ministry of Chemical Industry, replacing the Minister of Chemical Industry, Sun Jingwen--a member of the so-called "petroleum faction" of politicians who supported the grandiose economic programs of Deng's political opponents--with a more competent and politically tenable "technocrat," 58-year-old Qin Zhongda. Qin, a former Vice-Minister of Chemical Industry, was once Director of the Dalian Chemical Works and a Departmental Director of the Ministry of Chemical Industry. As such, Premier Zhao was able to use the guise of "legal authority" to place into command the person he felt was "most qualified" to lead the Ministry of Chemical Industry during his tenure as State Premier.

On 8 March 1982, the *New York Times* reported Zhao's reform of China's State Council, stating that the goal was to "set an example for the country by trimming and reorganizing the highest level of government." The article reported that the Chinese leadership had overhauled its administrative apparatus by paring a dozen of its ministries and commissions down to six and selecting slightly younger people to run three of the enlarged ministries. Officially, China reduced its number of deputy prime ministers to two from thirteen. The 98 ministries, commissions and agencies were reduced to 52.

The establishment of a Standing Committee was also part of the Zhao-led reforms. China announced that the Standing Committee would consist of the prime minister, the two deputy prime ministers, various ministers and a

secretary general. The move simplifies the decision-making process by "empowering the smaller Standing Committee to act for the government in setting policy, much as does the existing Standing Committee of the National People's Congress."

Premier Zhao's changes, including staff cuts of one-third, were in full accord with the pledge he made at the National People's Congress in December 1991 to make China's bureaucracy more efficient by reducing it to manageable proportions.

The New China News Agency said that the overall streamlining plan would cut the total ministerial staff from 49,000 to 32,000. The staffs of the 12 ministries and commissions immediately affected by the new measures were reduced to about 5,900 from nearly 8,700. Their ministers and deputy ministers declined to 27 from 117, the average age dropping to 57 from 64.

In addition to reducing China's state bureaucracy, China announced that each Government ministry would be limited to a minister and two to four deputy ministers, with no more than one chief and two deputies in each department. It was disclosed earlier that the Chinese Government had 1,000 ministers and deputy ministers and 5,000 department and bureau chiefs.

The streamlining of the first ministries affected by the overhaul led to the promotion of Qin Zhongda as Minister of Chemical Industry. Qin, 58, previously Deputy-Minister of the Chemical Industry, once supervised the chemical works in the port city of Dalian. Under the auspices of the reorganization, Sun Jingwen relinquished his post.

c. Yang Yibang: Premier Zhao Ziyang also used the State apparatus to oust another Vice-Minister of Chemical Industry in 1982. The New China News Agency reported on 27 July that Chinese Vice-Minister Yang Yibang was placed on two years probation within the Party and removed from all his Party posts in accordance with a recent decision of the Party Central Committee Discipline Inspection Commission, based on his "actions in violation of Party discipline and government regulations."

Yang Yibang was formerly a member of the leading Party group in the Ministry of Chemical Industry and Secretary of the Communist Party Committee (and concurrently General Manager) of the Yanshan General

Petrochemical Corporation of Peking. The commission recommended his removal from administrative posts and assigned other work.

A state investigation found that Yang Yibang had illegally signed a memorandum for a high-value loan with a Hong Kong businessman who falsely presented himself as a representative of a powerful international consortium. Yang Yibang appointed the businessman as an adviser to the Yanshan General Petrochemical Corporation. In this capacity, the businessman used the title of corporation agent to swindle others outside China. As a result, China's "international prestige was seriously compromised."

The State Council also accused Yang Yibang of bypassing the Foreign Ministry and Chinese embassies by having the Hong Kong man arrange visas for him to Japan and Belgium, where he sought foreign loans and made study tours. These actions violated the rules and regulations of the State Council and Foreign Ministry, the decision said. The decision pointed out that Yang Yibang's actions violated the rules of conduct for Chinese Communist Party members as well as discipline for government functionaries.

d. Qin Zhongda: Qin Zhongda was the first "technocrat" to lead China's Ministry of Chemical Industry. Identified as a patron of national leader Deng Xiaoping and Premier Zhao Ziyang, Qin instituted many reforms within the Ministry of Chemical Industry to raise its standards of organizational professionalism and to de-politicize the Ministry.

Among Qin's many achievements was his success in orchestrating international chemical ventures, particularly with Western European nations. He also promoted the professionalization of his staff, placing technocrats into positions normally occupied by political appointees who lacked sufficient technical skills to manage Ministry of Chemical Industry programs. Finally, Qin introduced capitalistic reforms into the chemical industry, creating market-based incentives on products, marketing and production efficiency.

Now-Premier Li Peng, whom then-Premier Zhao Ziyang demoted as part of the national bureaucratic reforms of 1982, became Premier after the state sacked Zhao Ziyang in response to the Tiananmen Square crisis in Beijing in June 1989. Qin was forced to resign shortly after the Tiananmen

massacre in favor of Ms. Gu Xiulian, the capable, popular and politically adept governor of Jiangsu Province.

e. Gu Xiulian: Ms. Gu Xiulian has had a fascinating career as a bureaucrat and government leader in China. Born a peasant in Nantong, Jiangsu Province in 1937, Gu was forced by poverty to abandon secondary school. She joined the Chinese Communist Party in 1956 and studied in the Shenyang Metallurgical and Mechano-electrical School in 1958. After graduation from the school in 1961, Gu worked as a technician in the Gansu-Jinchuan Non-ferrous Metals Corporation and later in the Science and Technology Information Institute under the Ministry of Textile Industry. In 1973, Gu transferred to Beijing as Vice-Minister of the State Planning Commission; In 1983 she became the first woman governor in China, leading Jiangsu Province, a province of 60 million citizens. In 1989, she became Minister of Chemical Industry, a position she retains in 1995.

Gu's political savvy allowed her to avoid victimization during the political wranglings of the Cultural Revolution. Some evidence suggests she enjoyed the favor of Deng Yingchao, the wife of the late Premier Zhou Enlai. An association with Zhou would provide Gu a great among of prestige and would also provide her with an entree to the current Premier, Li Peng, whom Zhou adopted as a son. Zhou Enlai and many of those considered to be part of his faction avoided being purged through skillful political maneuvering and equivocation.

In 29 April 1983, the Sixth Provincial People's Congress of Jiangsu elected Gu Xiulian as Governor of Jiangsu Province. As China's first and only female governor, Gu led China's premier province in industrial output, a showcase of economic reform with its rapid growth, especially of rural factories. The Seventh Provincial People's Congress reelected Gu as Jiangsu Governor in February 1988.

Gu, who is married to a nuclear scientist and has two sons, is often cited for her accomplishments as a woman leader in China, a nation where males still predominate among the leadership. However, she has not aggressively championed the cause of women in China, but has rather relied on her own merits as a politically-reliable leader to justify her rise within the state bureaucracy. Concerning gender discrimination, for example, she once stated that "in Jiangsu we already have several woman cadres. If women feel

they are discriminated against at work they can take their problem to the Women's Federation."

Much of the fascination with Gu stems from the fact that she has served in a sensitive position as governor of Jiangsu Province, north of Shanghai. In this capacity, she has led a province in the forefront of the nation's drive for modernization--one which involves increasing contacts with the outside world and market-oriented economic reform.

Gu Xiulian's success as Governor of Jiangsu can largely be attributed to her efforts to establish fruitful international contacts. For example, in May 1984 she conducted a 5-day visit to New York State at the invitation of Governor Mario Cuomo to establish a formal state-province relationship (similar to "sister city" relations) between Jiangsu and New York. Concluded on 23 May, this relationship included special consideration for economic development, educational and cultural exchanges (Jiangsu, one of China's 21 provinces, is located in middle of China's eastern maritime region on the coast of the East China Sea; it is similar to New York in that it has both an agricultural and industrial base).

Gu's international visits as governor were a precursor to a formal policy China adopted in September 1985 to open three major cities to foreign investment as part of its overall plan to develop the Yangtze River delta area. Known as the "golden triangle" in the "land of rice, silk and fish", the Yangtze Delta, including the three cities--Suzhou, Wuxi and Changzhou--that lie on the same axis of the Shanghai-Nanjing railway--provide outstanding conditions for economic development and investment.

Gu cited that in 1984 the Yangtze Delta cities' gross output value of industry and agriculture, revenue and purchase of goods for export accounted for 40, 45 and nearly 50 percent, respectively, of Jiangsu's total. The plan to open these cities to international investment aimed to readjust the economic structure in the light of the development of export industries. As such, China decided to import technology to upgrade existing enterprises and develop advanced, precision and highly sophisticated products. In addition to the light, textile, electronics, metallurgy, machinery, chemical and building materials industries, the cities also incorporated new fields, such as large integrated circuits, microcomputers, bioengineering, lasers and new materials.

Gu said Jiangsu Province would provide preferential treatment and convenience in management and administration for foreign businessmen who engage in joint ventures, cooperative enterprises and enterprises with exclusive foreign investment. In 1984, China opened two other Jiangsu coastal cities to foreign investors--Nantong and Lianyungang.

Ms. Gu Xiulian also sponsored and participated in military-related activities during her tenure as Jiangsu Governor. For example, on 6 September 1986, she participated in a grand ceremony to inaugurate the Chinese People's Liberation Army Army Command Academy. Following a Central Military Commission directive, the Chinese PLA Nanjing higher army academy was renamed the Chinese PLA Army Command Academy. As an institute of higher education for training combined-tactics commanders, the academy was placed under the leadership of the PLA General Staff Department. Gu attended the formal inauguration, along with Han Huaizhi, Deputy Chief of General Staff of the PLA; Xi Guangyi of the PLA General Logistics Department; and Xiang Shouzhi, Commander of the Nanjing Military Region.

On 24 October 1986, the *Economic Daily* announced that China's Ministry of Astronautics had joined forces with Jiangsu Province to promote new astronautics technology. According to an agreement signed by Minister Li Xu'e and Gu Xiulian in Nanjing, Jiangsu will provide bilateral preferential treatment in testing and producing new products and technology. The technical cooperation covered technical innovation, automation, key scientific and research projects, textiles, energy, building materials and communications. According to the article, both sides are conducting research projects on miniature computer color television tubes; new printing and dying equipment; and electronic medical apparatus.

In the wake of the Tiananmen crisis of June 1989, new Premier Li Peng facilitated Gu Xiulian's ascension to Minister of Chemical Industry by forcing Qin Zhongda, a Zhao Ziyang protégé, from office. A New China News Agency release on 15 April noted that the Standing Committee of the Seventh Jiangsu Provincial People's Congress had accepted Gu Xiulian's resignation as Jiangsu Governor, replacing her with her deputy, Chen Huanyou. The item stated the Central Government would appoint Gu to an "unspecified post."

Later, on 6 July, the New China News Agency announced that the

Eighth Standing Committee of the National People's Congress elected Gu Xiulian Minister of Chemical Industry. The news item hailed Gu as "experienced and familiar with economic work, and [as someone who] has made contributions to the economic development of Jiangsu Province since 1982." Without further explanation, the article reported that the National People's Congress Standing Committee accepted the resignation of 65-year-old Minister of Chemical Industry Qin Zhongda, who had been Minister of Chemical Industry since 1982. It gave no reason for the change.

2. Members of Quasi-Official Organizations:

In addition to the Ministry of Chemical Industry, China uses the personnel of several quasi-official organizations to manage many of its chemical-related activities. These organizations often employ former Ministry of Chemical Industry bureaucrats as "figurehead" leaders or policy consultants. The following personnel are associated with the China National Petrochemical Industrial Corporation, the China National Chemical Construction Corporation and the China National Chemicals Import and Export Corporation.

a. China National Petrochemical Industrial Corporation (中国石油化工总公司) (Sinopec):

Li Renjun (李人俊):	Chairman, Board of Directors; also Advisor, State Planning Commission
Sun Jingwen (孫敬文):	Vice-Chairman
Sun Xiaofeng (孫曉風):	Vice-Chairman
Xu Liangtu (徐良圖):	Vice-Chairman
Ma Yi (馬儀):	Vice-Chairman
Chen Jinhua (陳錦華):	President
Sheng Huaren (盛華仁):	Vice-President
Fei Zhirong (費志融):	Vice-President (removed, Aug 1990)
Zhang Wanxin (unknown):	Vice-President (1984)
Li Yizhong (李毅中):	Vice-President
Yan Sanzhong (閻三忠):	Vice-President

b. China National Chemical Construction Corporation (中国化工建

設總公司) (CNCCC):

Shen Chengxian (unknown):	Director
An Yuzong (安郁综):	Chairman, Board of Directors
Liu Pengyou (劉朋友):	President
Jiang Yingbin (姜英斌):	Vice-President
Deng Zhunsheng (鄧準生):	Vice-President

c. China National Chemicals Import and Export Corporation (中國化工進出口總公司) (Sinochem):

Zhu Dazhi (朱達志):	Chairman (now Director, China National Offshore Oil Corporation (CNOOP)
Zheng Dunxun (鄭敦訓):	President
Chen Haoran (陳浩然):	Executive Vice-President
Zhou Yu (周玉):	Vice-President
Li Fengting (李鳳亭):	Vice-President
Zhang Yuke (張玉科):	Vice-President
Zhang Rongming (張榮明):	Vice-President

3. Researchers and Authors:

The following is a list of researchers and authors who have produced works on China's perception of chemical and biological warfare. Although those associated with Hong Kong's Contemporary Military Literature (現代軍事/xiandai junshi) [CONMILIT] defense monthly often work outside of Mainland China, the Hong Kong journal is a subsidiary of the Mainland Chinese defense establishment. They often publish both in internal and external publications; therefore, they likely have an intelligence-gathering function that emphasizes unclassified technical information. Note also that many names listed below may be pseudonyms.

Name	*Affiliation*	*Area of Expertise*
常學強 (Chang Xueqiang)	CONMILIT	CB protection equipment
陳讓林 (Chen Ranglin)	CONMILIT	CB protective clothing

程水亭 (Chen Shuiting)	Soldier Press	chemical weapons
陳亞 (Chen Ya)	CONMILIT	riot control agents
丁前星 (Ding Qianxing)	CONMILIT	chemical reconniassance; chemical detonation; chemical defense training
方文君 (Fang Wenjun)	CONMILIT	CB weapons
郎宗亨 (Lang Zongheng)	CONMILIT; Ordnance Knowledge	binary chemical weapons; Iran-Iraq War; chemical disarmament
李軍 (Li Jun)	CONMILIT; Ordnance Knowledge	chemical warfare in the Persian Gulf War
黎雲 (Li Yun)	CONMILIT	chemical weapons treaty verification; CB decontamination for air force units; Taiwan's CB defense capabilities
劉守勁 (Liu Shoujin)	CONMILIT	CB protection for the wounded; water supply equipment on the CB battlefield
虜輝 (Lu Hui)	Military Science Publishing Company	general analysis of CB warfare
啓秀 (Qi Xiu)	Military World	CB protective clothing
馬国基 (Ma Guoji)	Military World	CB protective clothing

石志遠 (Shi Zhiyuan)	Soldier Press	chemical weapons
孫玉鎖 (Sun Yusuo)	CONMILIT	biological warfare; toxins and micotoxins; CB treaty verification techniques; emerging BW threats
王菽珍 (Wang Shuzhen)	CONMILIT	CB protection of armored vehicles
王新民 (Wang Xinming)	CONMILIT	CW decontamination
武星 (Wu Xing)	CONMILIT	CB reconnaissance
奚啓新 (Xi Qixin)	Military World	modern technology and CB warfare
余再弟 (Yu Zaidi)	CONMILIT	CW in the Middle East
于中洲 (Yu Zhongzhou)	CONMILIT	CW and disarmament
遠方 (Yuan Fang)	CONMILIT	chemical agents in Russia
曾永珠 (Zeng Yongzhu)	CONMILIT	riot control agents
張國昌 (Zhang Guochang)	Military World	binary chemical weapons; CW threats; riot control agents; CB modernization; Persian Gulf War; CB disarmament; chemical munitions;
周道明 (Zhou Daoming)	CONMILIT	CB protection for the wounded

4. Members of the Chinese People's Liberation Army: China rarely reveals the names of personnel involved in nuclear, chemical and biological warfare. However, Major General Jiang Zhizeng is a clear exception to this practice.

In 22 July 1986, the *China Daily* revealed that General Jiang was chief of the People's Liberation Army Chemical Defense Department, a position from which he commanded all military-associated activities involved with nuclear, chemical and biological warfare.

Earlier, on 13 August 1981, the New China News Agency reported that the national leadership had acknowledged Jiang--then Director of the Anti-chemical Warfare Department of the People's Liberation Army Fuzhou units--for his "diligent study of modern science and technology" and for leaded scientific and technological personnel to improve 14 anti-chemical and anti-atomic warfare techniques. The People's Liberation Amry Fuzhou Units commended him in a circular in July 1990.

Since joining the Chinese army 1945, Jiang Zhizeng reportedly has been commended 14 times for meritorious service. Soon after China was established, Jiang became chief of the anti-chemical warfare section of an unnamed unit. When he learned of China's backwardness in anti-chemical warfare science and technology, he was "compelled by a strong sense of responsibility" to become an expert and contribute to the army's modernization. Although Jiang reportedly had only five years of formal schooling, has studied nuclear physics, mathematics and organic chemistry to understand the principles of chemical and atomic weapons.

In addition to studying military science, Jiang reportedly has also worked to devise China's program of anti-nuclear and anti-chemical warfare tactics and techniques in "mountainous and hilly areas and on plains, beaches and various other terrains and under various weather conditions." Jiang also organized various units to conduct live ammunition exercises to help them gain practical knowledge and experience in real combat. He has directed scientific researchers to conduct various anti-chemical warfare experiments on "various kinds of animals and plants." After acquiring a great ammount of data and information, Jiang cooperated with other members of his department to study new techniques and produce instruments to make chemical detection methods satisfy the requirements of modern warfare.

CHAPTER 8:

TABLE OF CHEMICAL AND BIOLOGICAL AGENTS

PART I. CHEMICAL AGENTS. Although the Chinese classify chemical agents in a variety of ways--such as by degree of persistence, dispersal methods, and so forth--the following table represents the six most common categories of classification of the primary agents. In some cases, the Chinese do not view riot control gases or other irritants as true chemical agents, perhaps because they are non-lethal and are often employed outside of military circles. However, key references such as field commanders' handbooks and military dictionaries generally include riot control agents as listed below.

1. 神經性毒劑 (shenjingxing duji) NERVE AGENTS

Description: Nerve agents quickly disrupt the central nervous system by binding the enzymes crucial to nerve functions, causing convulsions or paralysis. The Chinese view nerve agents as the deadliest form of chemical agent; all nerve agent names are reprsented by transliterations, as listed below.

Chinese Name		English Name	US Code	USSR Code
沙林	(shalin)	Sarin	GB	P-35
塔崩	(tabeng)	Tabun	GA	P-18
梭曼	(suoman)	Soman	GD	P-55
維埃克斯	(weiaikesi)	VX	GF/VK	------

2. 全身中毒性毒剂 (quanshen zhongduxing duji) SYSTEMIC AGENTS/BLOOD AGENTS

Description: The Chinese sometimes refer to systemic agents by the Western name as blood agent (血液性毒剂/xueyexing duji). Systemic agents interfere with the use of oxygen at the cellular level, killing by inhibiting cell respiration. Systemic agents are particularly effective in penetrating most gas mask defenses. The Chinese refer to the two most common systemic agents by their chemical names, as listed below:

Chinese Name		English Name
氰化氢	(qinghua qing)	Hydrogen cyanide (AC)
氯化氰	(lühua qing)	Cyanogen chloride (CK)

3. 窒息性毒剂 (zhixixing duji) CHOKING/RESPIRATORY AGENTS

Description: Choking agents are highly volatile liquids which irritate and severely injure the lungs when inhaled, causing death from choking. The Chinese generally view choking agents as much less lethal than nerve or blood agents.

光氣	(guangqi)	Phosgene (CG)

4. 糜烂性毒剂 (milanxing duji) VESICANT/BLISTER AGENTS

Description: Vesicants, or blister agents, are oily liquids which burn and blister the skin and eyes within hours after exposure. They also have general toxic effects. Mustard gas is the most well-known example.

芥子氣	(jiezi qi)	(Sulpher) mustard gas (HD)/nitrogen mustard (HN)
路易氏氣	(luyishi qi)	Lewisite (L)

5. 失能劑 (shineng ji) INCAPACITATING AGENTS

Description: Also known as psycho-chemicals, incapacitating agents are the equivalent of drugs which cause temporary mental disturbances. They normally cause short-term ilnesses and create psychoactive effects, such as delirium and hallucinations. The most common incapacitating agent is BZ, transliterated below.

毕兹 (bici)	BZ (Benactyzine)

6. 刺激劑 (ciji ji)

IRRITANT/CONTROL AGENTS

Description: Control agents are non-lethal sensory irritants that cause a temporary flow of tears, irritation or burning of the skin and respiratory tract, nausea and vomiting. They are used in riot and population control as well as in war. These agents are popularly known in China as 催淚劑 (cuilei ji)/"tear gas" and as 防暴劑 (fangbao ji)/"riot control" agents. Although Adamsite (DM) is often classified as a "vomiting agent" (嘔吐劑/outu ji), the Chinese typically include it as an irritant/riot control agent.

西阿爾	xiaer	CN gas: Chloroacetophone (苯氯乙)
西埃斯	xiaisi	CS gas: O-Chlorobenzyl-malononitrile (CS) (鄰氯化苯亞甲基丙二)
亞當氏氣	yadang shi qi	Adamsite (DM) (二苯胺基氯砷)

PART II. BIOLOGICAL AGENTS. The Chinese classification scheme for biological warfare agents is much less well-defined than that of chemical agents. While analysts in the West ususally classify such agents into bacterial, fungal, rickettsial and viral categories, China has no fixed paradigm. In fact, many Chinese sources also include toxins as biological agents. Generally, Chinese view all such agents as part of the following six main categories. See Chapter 4 for a table of combat performance capabilities of common biological agents as viewed by Chinese military sources.

1. 細菌 (xijun)	Bacteria	
鼠疫桿菌	shuyi ganjun	Bubonic plague bacillus
炭疽桿菌	tanju ganjun	anthrax bacillus
霍亂弧菌	huoluan hujun	cholera vibrio
野兔熱桿菌	yeture ganjun	Tulameria bacillus (rabbit fever)
類鼻疽桿菌	leibi ju	meliodosis bacillus
馬鼻疽桿菌	mabiju ganju	Glanders bacillus (equina)

2. 病毒 (bingdu)	Virus	
黄熱病病毒	huangrebing	yellow fever virus
東方馬腦炎病毒	dongfang ma naoyan	Oriental equine encephalitis virus
天花病毒	tianhua	smallpox virus
登革熱	denggere	Dengue fever
立夫特山谷熱	lifute shangu re	Rift Valley fever
布氏桿菌	Bu shi ganjun	Brucella bacillus
痢疾	liji	dysentary

3. 立克次體 (likeciti) Rickets

Q 熱	Q re	Q fever (query fever)
落磯山斑疹傷寒立克次體	luojishan banzhen shanghan likeciti	Rocky Mountain Fever

4. 衣原體眞菌 (nongyuanti zhenjun) Coccoid Fungus

鸚鵡熱	yingwu re	psittacosis (ornithosis)

5. 眞菌 (zhenjun) Fungus

粗球孢子菌病	cuqiu baozi junbing	staphylococcus

6. 毒素 (dusu) Toxin

肉毒桿菌毒素	roudu ganjun dusi	botulin bacillus toxin

CHAPTER 9:

GLOSSARY

This glossary of technical terminology reflects the Chinese language used in open source articles and specialized reference resources concerning chemical and biological warfare. Each item has been verified in multiple sources to ensure its accuracy.

G類毒劑	G lei duji	G class chemical agent (nerve agent)
Q熱	Q re	Q fever (query fever)
V類毒劑	V lei duji	V class chemical agent (nerve agent)
阿托品	Atuopin	Atropine (transliteration)
安非他命	anfeitaming	amphetamine (transliteration)
安全濃度	anquan nongdu	safe (allowable) concentration
巴比妥酸鹽	babituosuanyan	barbituate
白喉	baihou	diptheria
百日咳	bairike	whooping cough
本氣乙	benlyuyi(tong)	Chloroacetophenome (irritant) (CN)
筆慈	bici	BZ (benactyzine) (an incapacitating

		agent)
病毒	bingdu	virus
布氏桿菌	Bu shi ganjun	Brucella bacillus
佈灑	busa	dispersal
倉庫	cangku	depot
常規導彈	changgui daodan	conventional missiles (guided)
常規炮彈	changgui paodan	conventional artillery
赤痢	chili	dysentary
遲滯性化學襲擊	chizhixing huaxue xiji	delaying chemical attack
刺激性毒劑	cijixing duji	irritant agent (control agent)
抽風	choufeng	convulsion
出大汗	chu dahan	excessive perspiration
出血嚴重	chuxue yanzhong	severe bleeding
除莠劑	chuyouji	herbicide; weed killer
粗球孢子菌病	cuqiu baozi junbing	staphylococcus
催淚彈	cuilei dan	tear-gas grenade
催淚劑	cuilei ji	tear gas (irritant)
大麻	dama	cannabis; cannabinoid
單端孢毒素	danduanbao dusu	tricothecene toxin
導彈	daodan	missile (guided)
德國麻疹	deguo mazhen	German measles

登革熱	denggere	Dengue fever
東方馬腦炎病毒	dongfang ma naoyan bingdu	Oriental equine encephalitis virus
毒氛	dufen	chemical cloud
毒劑	duji	chemical agent
毒劑報警器	duji baojingqi	chemical agent warning equipment
毒品	dupin	narcotic; drug
毒氣	duqi	poisonous gas
毒氣彈	duqi dan	chemical bomb
毒氣工業	duqi gongye	chemical (agent) industry
毒氣探測器	duqi tanceqi	chemical detection kit
毒區	duqu	contaminated area
毒素	dusu	toxin; poisonous matter
毒團	dutuan	chemical cloud
毒瓦斯	du wasi	poisonous gas
毒襲	du xi	chemical attack
毒襲區	duxiqu	gas attack zone
毒性	duxing	toxicity
毒藥	duyao	poison; toxicant
惡心	exin	nausea
二元化學武器	erhuan huaxue wuqi	binary chemical weapon
二氯二乙硫醚	erqieryiliumi	(chemical term for mustard gas)

發汗	fahan .	to sweat (medical symptom)
發熱	fare	to run a fever
發燒	fashao	fever
反細菌戰	fan xijunzhan	anti-bacteriological warfare
防暴劑	fangbao ji	riot control agent (irritant)
防暴手榴彈	fangbao shouliudan	riot control (hand) grenade
暴武器	fangbao wuqi	riot control weapon
防毒服	fangdu fu	protective suit
防毒面具	fangdu mianju	gas mask (套/tao)
防毒手套	fangdu shoutao	protective gloves
防毒鞋	fangdu xie	protective boots; protective footwear
防毒衣	fangdu yi	protective clothing ensemble
防護措施	fanghu cuoshi	defensive measures
防護方法	fanghu fangfa	defensive measures
防護訓練	fanghu xunlian	defensive training
防護裝備	fanghu zhuangbei	defensive equipment
防護準備	fanghu zhunbei	defensive preparations
防化兵	fanghua bing	anti-chemical troops
防化學	fang huaxue	chemical defense; antichemical defense
防化學服	fang huaxue fu	antichemical clothing

防化學器材	fang huaxue qicai	antichemical facilities
非致死性毒劑	fei zhisixing duji	non-lethal agent
沸點	feidian	boiling point
飛機佈灑	feiji busa	air (aircraft) dispersal
飛毛腿	feimaotui	Scud (missile)
風濕(病)	fengshi(bing)	rheumatism; rheumatic (fever)
復合毒氣	fuhe duqi	binary poisonous gas
腹痛	futong	abdominal pain
腹瀉	fuxie	diarrhea
桿菌	ganjun	bacillus; bacilli
感冒	ganmao	flu; cold symptoms
高山癥	gaoshanzheng	altitude sickness
個人防護	geren fanghu	individual (personal) defense
公斤	gongjin	kilogram
光氣	guangqi	phosgene (choking agent) (CG)
過濾式防毒面具	guolyushi fangdu mianju	filtration gas mask
過濾式防護	guolyushi fanghu	filtering protection
海洛英	hailuoying	heroin (transliteration)
海灣戰爭	haiwan zhanzheng	Gulf War

核生化部隊	heshenghua budui	nuclear, biological and chemical unit
黑死病	heisibing	black plague (used in Japanese biological war against China)
紅腫	hongzhong	to be red and swollen
弧菌	hujun	vibrio
呼吸道	huxidao	respiratory tract
呼吸困難	huxi kunnan	respiatory problems
化合物	hua hewu	chemical compound
化肥司	huafei si	Chemical Fertilizer Department (Ministry of Chemical Industry)
化工司	huagong si	Chemical Department (Ministry of Chemical Industry)
化工研究總院	huagong yanjiu zongyuan	Chemical Research Institute (Ministry of Chemical Industry)
化學部隊	huaxue budui	chemical corps; chemical troops
化學生物放射物分隊	huaxue, shengwu, fangshewu fendui	chemical, biological and radiological element (unit)
化學兵	huaxuebing	chemical corps (chemical troops)
化學兵器	huaxue bingqi	chemical weapon
化學兵器中心	huaxue bingqi zhongxin	chemical weapons center
化學兵器基地	huaxue bingqi jidi	chemical weapons base (post)
化學(兵)部隊	huaxue(bing) budui	chemical warfare troops

化學彈藥	huaxue danyao	chemical ammunition
化學導彈	huaxue daodan	chemical missile
化學兵學校	huaxuebing xuexiao	chemical warfare school
化學彈	huaxuedan	chemical bomb; chemical projectile
化學地雷	huaxue dilei	chemical mine
化學防護能力	huaxue fanghu nengli	chemical protection capability
化學分隊	huaxue fendui	chemical element (military unit)
化學工廠	huaxue gongchang	chemical plant
化學工業部	huaxue gongyebu	Ministry of Chemical Industry (China)
化學工業部張	huaxue gongye buzhang	Minister of Chemical Industry (China)
化學火箭	huaxue huojian	chemical rocket
化學激光器	huaxue jiguangqi	chemical laser
化學空中襲擊	huaxue kongzhong xiji	chemical air attack
化學(兵軍)官	huaxue(bing) junguan	chemical officers
化學品	huaxuepin	chemical product
化學迫陸炮	huaxue polupao	chemical mortar
化學器材倉庫	huaxue qicai cangku	chemical depot
化學器材倉庫連	huaxue qicai cangku lian	chemical depot company
化學槍榴彈	huaxue qiangliudan	chemical grenade
化學情報	huaxue qingbao	chemical corps intelligence
化學技術情報組	huaxue jishu qingbao zu	chemical intelligence team
化學迫陸炮（彈）	huaxue polu pao(dan)	chemical mortar (shell)

化學生物放射物分隊	huaxue shengwu fangshewu fendui	chemical, biological and radiological element
化學手榴彈	huaxue shouliudan	chemical hand grenade; chemical grenade
化學武庫	huaxue wuku	chemical munitions depot
化學武器	huaxue wuqi	chemical weapon
化學武器庫	huaxue wuqiku	chemical weapons arsenal
化學武器技術	huaxue wuqi jishu	chemical weapons technology
化學襲擊	huaxue xiji	chemical attack
化學消毒法	huaxue xiaodufa	chemical disinfection
化學消毒連	huaxue xiaodulian	chemical decontamination company
化學炸彈	huaxue zhadan	chemical bomb
化學戰（術）	huaxuezhan(shu)	chemical warfare
化學戰能力	huaxuezhan nengli	chemical warfare capability
化學戰訓練	huaxuezhan xunlian	chemical warfare training
化學戰演習	huaxuezhan yanxi	chemical warfare exercise
化學戰戰場	huaxuezhan zhanchang	chemical warfare battlefield
化學戰專家(們)	huaxuezhan zhuanjia(men)	chemical warfare specialist(s)
化學戰劑	huaxue zhanji	chemical (warfare) agent
化學戰劑武器	huaxue zhanji wuqi	chemical agent weapon
化學偵察	huaxue zhencha	chemical reconnaissance
化學偵察器材料	huaxue zhenchaqi cailiao	chemical reconnaissance equipment

化學偵察員	huaxue zhenchayuan	chemical reconnaissance personnel
化學偵察訓練	huaxue zhencha xunlian	chemical reconnaissance training
化學指示劑	huaxue zhishji	chemical indicator
化學作戰	huaxue zuozhan	chemical operations
壞血病	huaixuebing	scurvy
壞血性毒劑	huaixuexing duji	blood agent
黄熱病	huangrebing	yellow fever
黄熱病病毒	huangrebing bingdu	yellow fever virus
黄雨	huangyu	yellow rain
昏迷	hunmi	coma
火箭	huojian	rocket
霍亂	huoluan	cholera
霍亂弧菌	huoluan hujun	cholera vibrio
集體防護	jiti fanghu	collective defense
計劃司	jihuasi	Planning Department (Ministry of Chemical Industry)
急性的	jixingde	acute
檢疫	jianyi	quarantine
脚氣病	jiaoqibing	beri-beri
解放軍防化兵	jiefangjun fanghua bing	(Chinese) People's Liberation Army anti-chemical troops

芥子氣	jiezi qi	mustard gas (vesicant) (H)
進攻性化學戰	jingongxing huaxuezhan	offensive chemical warfare
精神病	jingshenbing	psychosis
酒精	jiujing	alcohol
菌類	junlei	fungus
軍事化学（們）	junshi huaxuejia(men)	military chemist(s)
抗熱戰爭	kangri zhanzheng	War of Resistance Against Japan
抗生素	kangshengsu	antibiotic
呵待因	kedaiyin	codeine (transliteration)
咳嗽	kesou	cough
控暴武器	kongbao wuqi	riot control weapon
口干	kougan	dryness of mouth
快克	kuaike	crack (cocaine)
狂犬病	kuangquanbing	rabies
潰爛	kuilan	inflammation
藍埃克斯	lan aikesi	Blue-X
藍色毒劑	lanse duji	Agent Blue
類鼻疽桿菌	leibi ju	meliodosis bacillus
立夫特山谷熱	lifute shangu re	Rift Valley fever
痢疾	liji	dysentary

立克次氏體	likecishiti	rickettstal (transliterartion)
兩伊	liang Yi	Iran and Iraq
兩伊戰爭	liang Yi zhanzheng	Iran-Iraq War
流鼻涕	liu biti	runny nose
流口水	liu koushui	salivation
流淚	liu lei	tearing; runny eyes
陸軍化學兵	lujun huaxue bing	Chemical Corps
路易氏氣	luyishi qi	Lewisite (transliteration) (vesicant) (L)
落磯山斑疹傷寒立克次體	luojishan banzhen shanhan likeciti	Rocky Mountain rickettsia
落葉劑	luoycji	defoliant
氯氣	lyuqi	chlorine gas
氯化氰	lyuhuaqing	cyanogen chloride (systemic/blood agent) (CG)
嗎啡	mafei	morphine (transliteration)
麻藥	mayao	anesthetic
麻疹	mazhen	measles
麻醉	mazui	anesthesia
馬鼻疽桿菌	mabiju ganju	Glanders bacillus
慢性的	manxingde	chronic

美沙誇龍	meishakualong	methaqualone (transliteration)
美沙桐	meishatong	methadone
糜爛性毒劑	milanxing duji	vesicant agent; blister agent
面部青紫	mianbu qingzi	facial pallor
媒介物	meijiewu	vector; agent
凝固點	ningdudian	solidification point
嘔吐	outu	vomit; vomiting
嘔吐劑	outu ji	vomiting agent
疲乏	pifa	weariness
皮膚	pifu	skin
皮膚刺痛	pifu citong	skin irritation
皮膚發癢	pifu fayang	skin irritation (itch)
皮膚傷害毒劑	pifu shanghai duji	skin-damaging toxic agent
破傷病	poshangbing	tetanus
七三一部隊	qi san yi budui	Unit 731 (Japanese chemical and biological warfare unit during World War II
氣壯	qizhuang	gas (form)
氫化氰	qinghua qing	hydrogen cyanide (systemic/blood

		agent) (AC)
全身肉跳	quanshen routiao	twitching of the body
全身中毒性毒劑	quanshen zhongdu wuqi	agent to poison the whole body (mostly "incapacitating agents")
日本帝国主義	Riben diguozhuyi	Japanese imperialism/imperialists
日内瓦公約	Rineiwa gongyue	Geneva Convention (1925)
染毒濃度	randu nongdu	contamination concentration
染毒區	randu qu	contaminated area
擾亂性化學襲擊	raoluanxing huaxue xiji	harassing chemical attack
人工呼吸	rengong xihu	artificial respiration
人員中毒	renyuan zhongdu	personnel contamination
肉毒桿菌毒素	roudu ganjun dusi	botulin bacillus toxin
三防	sanfang	the "Three Defenses" (nuclear, chemical and biological)
沙林	shalin	Sarin (transliteration) (nerve agent) (GB)
殺傷性化學襲擊	shashangxing huaxue xiji	injurious chemical attack
閃光	shanguang	The Flash (chemical agent)
傷害	shanghai	casualty (to harm)
傷害濃度	shanghai nongdu	injurious concentration

傷寒	shanghan	typhus; typhoid fever
傷寒桿菌	shanghan ganjun	typhoid bacillus
傷亡	shangwang	casualty (injured and killed)
神風特攻擊隊	shenfeng gongjidui	kamikaze unit
神經毒氣武器	shenjing duqi wuqi	nerve gas weapon
神經性毒劑	shenjingxing duji	nerve agent; nerve gas
滲透性	shentouxing	permeability
生物彈	shengwudan	biological projectile
生物戰	shengwuzhan	biological warfare
生物戰防御系統	shengwuzhan fangyu xitong	biological defense system
生物戰劑	shengwu zhanji	biological warfare agent
生物戰武器	shengwuzhan wuqi	biological weapon
失明	shiming	a loss of vision
失能性毒劑	shinengxing duji	incapacitating agent
失去知覺	shiqu zhijue	to lose consciousness
實地試驗	shidi shiyan	field testing
失眠	shiyan	insomnia
試驗場	shiyanchang	field test
手術	shoushu	operation (medical)
鼠疫	shuyi	plague
鼠疫桿菌	shuyi ganjun	Bubonic plague bacillus
水痘	shuidou	chickenpox

水泡	shuipao	blister
水染毒	shui randu	water contamination
死亡	siwang	death
損害	sunhai	to damage
梭曼	suoman	Soman (transliteration) (nerve agent) (GD)
速殺性毒劑	sushaxing duji	quick killing agent
塔崩	tabeng	Tabun (transliteration) (a nerve agent) (GA)
碳化氫	tanhuaqing	hydrocarbon
炭疽	tanju	anthrax
炭疽桿菌	tanju ganjun	anthrax bacillus
特久度	tejiudu	persistence
特久性毒劑	tejiuxing duji	persistent chemical agent
特久性糜爛毒劑	tejiuxing milan duji	persistent vesicant (blister) agent
疼痛	tengtong	pain; ache; soreness
天花病毒	tianhua bingdu	smallpox virus
天使鹿	tianshilu	phencyclidine; PCP; Angel Dust
痛風	tongfeng	gout
頭疼	touteng	headache
透氣防毒服	touqi fangdu fu	air permeable protective clothing

脱水	tuoshui	dehydration
蛙-七	Wa-qi	Frog-7 (chemical-capable rocket)
瓦斯	wasi	gas (generic/transliteration)
外事司	waishi si	Foreign Affairs Department (Ministry of Chemical Industry)
微生物	wei shengwu	microorganism
維埃克斯	weiaikesi	VX (transliteration) (nerve agent)
無臭	wuchou	odorless
無色	wuse	colorless
無味	wuwei	tasteless
細菌	xijun	bacteria
細菌所產生的毒素	xijun suo chanshengde dusu	bacteria-produced Fungus
細菌武器	xijun wuqi	biological weapon
細菌戰	xijunzhan	biological warfare
西埃斯	xiaisi	CS (O-chlorobenzamalonitrile) (irritant)
消毒	xiaodu	to disinfect; sterilize
消毒劑	xiaoduji	decontaminating agent; disinfectant
休克	xiuke	shock (transliteration)
學名	xueming	chemical name

血液性毒劑	xueyexing duji	blood agent (systemic agent)
亞當氏氣	Yadang shi qi	Adamsite (transliteration) (irritant) (DM)
鴉片	yapian	opiate
亞硝酸	yaxiaosuan	amyl nitrate
煙狀	yanzhuang	mist
眼孔散大	yankong sanda	dilation of the pupils
眼孔縮小	yankong suxiao	myosis
野兔熱桿菌	yeture ganjun	Tulameria bacillus (rabbit fever)
液滴狀	yedi zhuang	droplet (form)
液體	yeti	liquid
醫療救護	yiliao jiuhu	medical assistance; medical aid
醫學試驗	yixue shiyan	medical experiment
一氧化碳	yiyanghua tan	carbon dioxide
衣原體眞菌	yiyuanti zhenjun	coccoid fungus
疫癘	yili	bubonic plague
疫癘區	yili qu	epidemic area
乙醇	yichun	ethyl alcohol
疫癥	yizheng	epidemic
鸚鵡熱	yingwu re	psittacosis (ornithosis)
戰場試用	zhanchang shiyong	battlefield testing

暫時性毒劑	zhanshixing diji	transient chemical agent
戰術化學火箭	zhanshu huaxue huojian	tactical chemical rocket
眞菌	zhenjun	fungus; fungoid
眞菌毒素	zhenjun dusu	mycotoxin
偵察	zhencha	reconnaissance
偵毒設備	zhendu shebei	chemical detection device
蒸氣	zhengqi	vapor
癥狀	zhengzhuang	symptom
致死化學戰	zhisi huaxue wuqi	lethal chemical weapon
致死劑量	zhisi jiliang	lethal dose
致死染毒濃度	zhisi randu nongdu	lethal concentration
窒息	zhisi	asphyxiation
植物殺傷劑	zhiwu shashangji	herbicide
窒息性毒劑	zhixixing duji	choking agent; choking gas; respiratory agent
中樞神經系統	zhongshu shenjing xitong	central nervous system
中毒	zhongdu	poisoning
中暑	zhongshu	heat stroke
注射	zhushe	injection
走路不穩(定)	zoulu bu wen(ding)	unsteadiness in walking
作戰能力	zuozhan nengli	combat capability

THE CHINESE PERCEPTION OF

CHEMICAL AND BIOLOGICAL WARFARE

CHAPTER 10:

CHINESE BIBLIOGRAPHY

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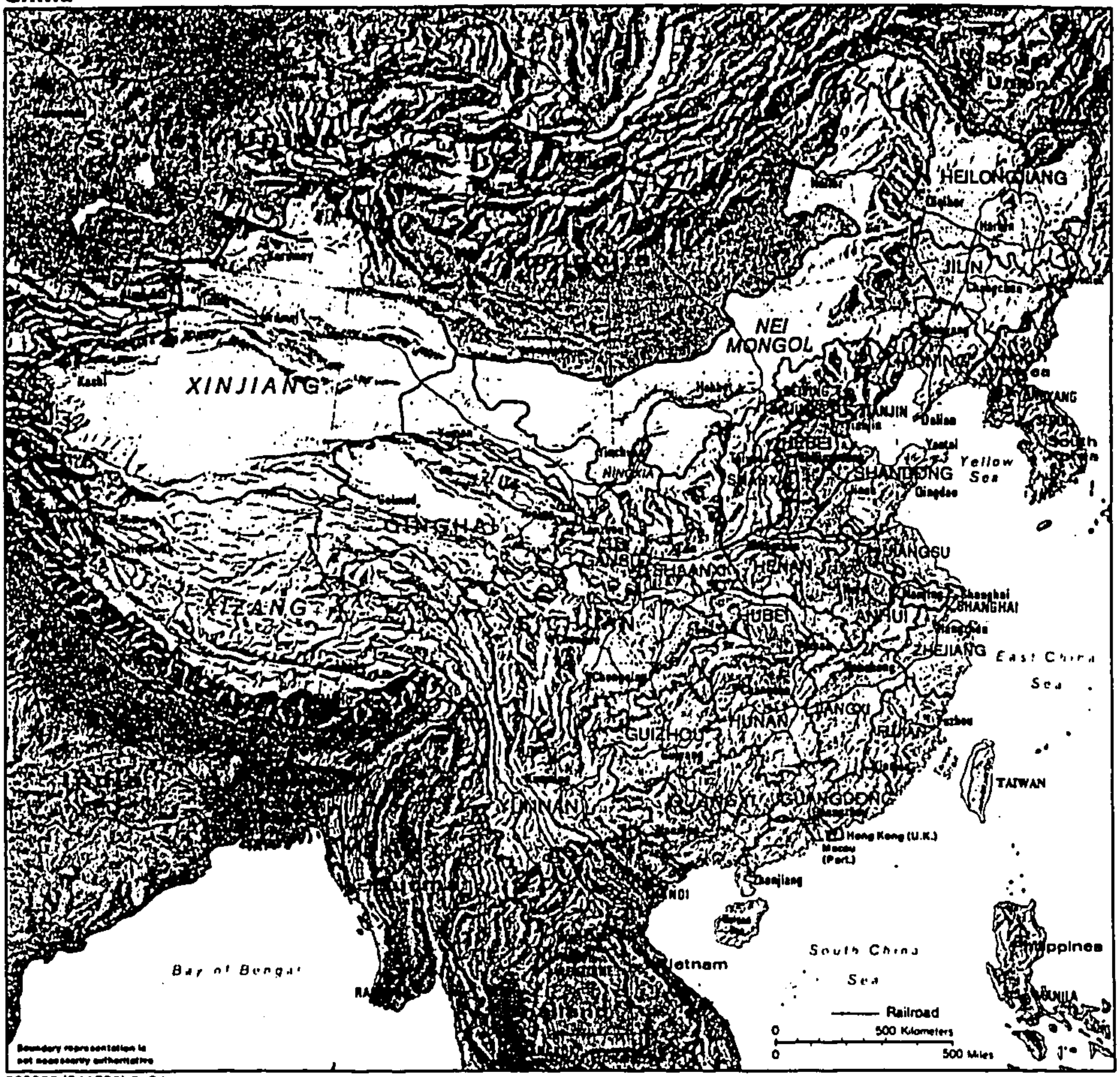
China



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Province-Level Names

Conventional	Characters	Pinyin	Pronunciation
Anhwei	安徽	Anhui	ahn · way
Chekiang	浙江	Zhejiang	juh · jee_ong
Fukien	福建	Fujian	foo · jee_en
Heilungkiang	黑龙江	Heilongjiang	hay · loong · jee_ong
Honan	河南	Henan	huh · non
Hopeh	河北	Hebei	huh · bay
Hunan	湖南	Hunan	hoo · nan
Hupeh	湖北	Hubei	huo · bay
Inner Mongolia	内蒙古	Nei Mongol	nay · mung · goo
Kansu	甘肃	Gansu	gahn · soo
Kiangsi	江西	Jiangxi	jee_ong · she
Kiangsu	江苏	Jiangsu	jee_ong · su
Kirin	吉林	Jilin	jee · lynn
Kwangsi	广西	Guangxi	g_wong · she
Kwangtung	广东	Guangdong	g_wong · doong
Kweichow	贵州	Guizhou	g_way · joe
Liaoning	辽宁	Liaoning	lee_ow · ning
Ningsia	宁夏	Ningxia	ning · she_ah
Peking	北京	Beijing	bay · jing
Shanghai	上海	Shanghai	shong · hi
Shansi	山西	Shanxi	shahn · she
Shantung	山东	Shandong	shahn · doong
Shensi	陕西	Shaanxi	shun · she
Sinkiang	新疆	Xinjiang	shin · jee_ong
Szechwan	四川	Sichuan	ssu · ch_wan
Tibet	西藏	Xizang	she · dzong
Tientsin	天津	Tianjin	te_en · jin
Tsinghai	青海	Qinghai	ching · hi
Yunnan	云南	Yunnan	yu_oon · nan